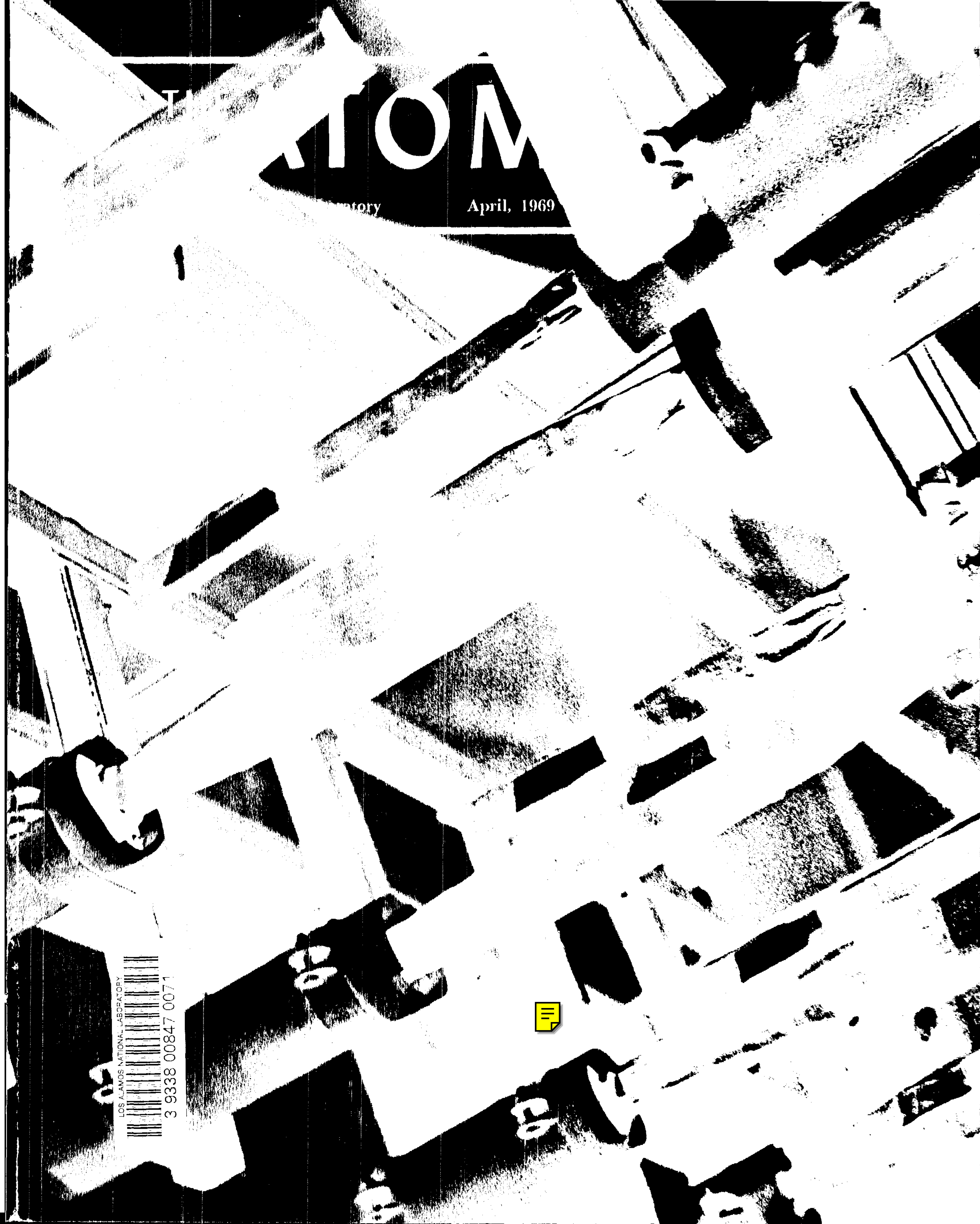

April, 1969

Volume 6 Number 4
April, 1969

THE ATOM

Published monthly by the University of California, Los Alamos Scientific Laboratory, Office of Public Relations, P. O. Box 1663, Los Alamos, New Mexico 87544. Second Class Postage Paid at Los Alamos.

CONTENTS:

Editor: Kenneth J. Johnson

Photography: Bill Jack Rodgers and Bill Regan

Contributors: Members of the Public Relations staff

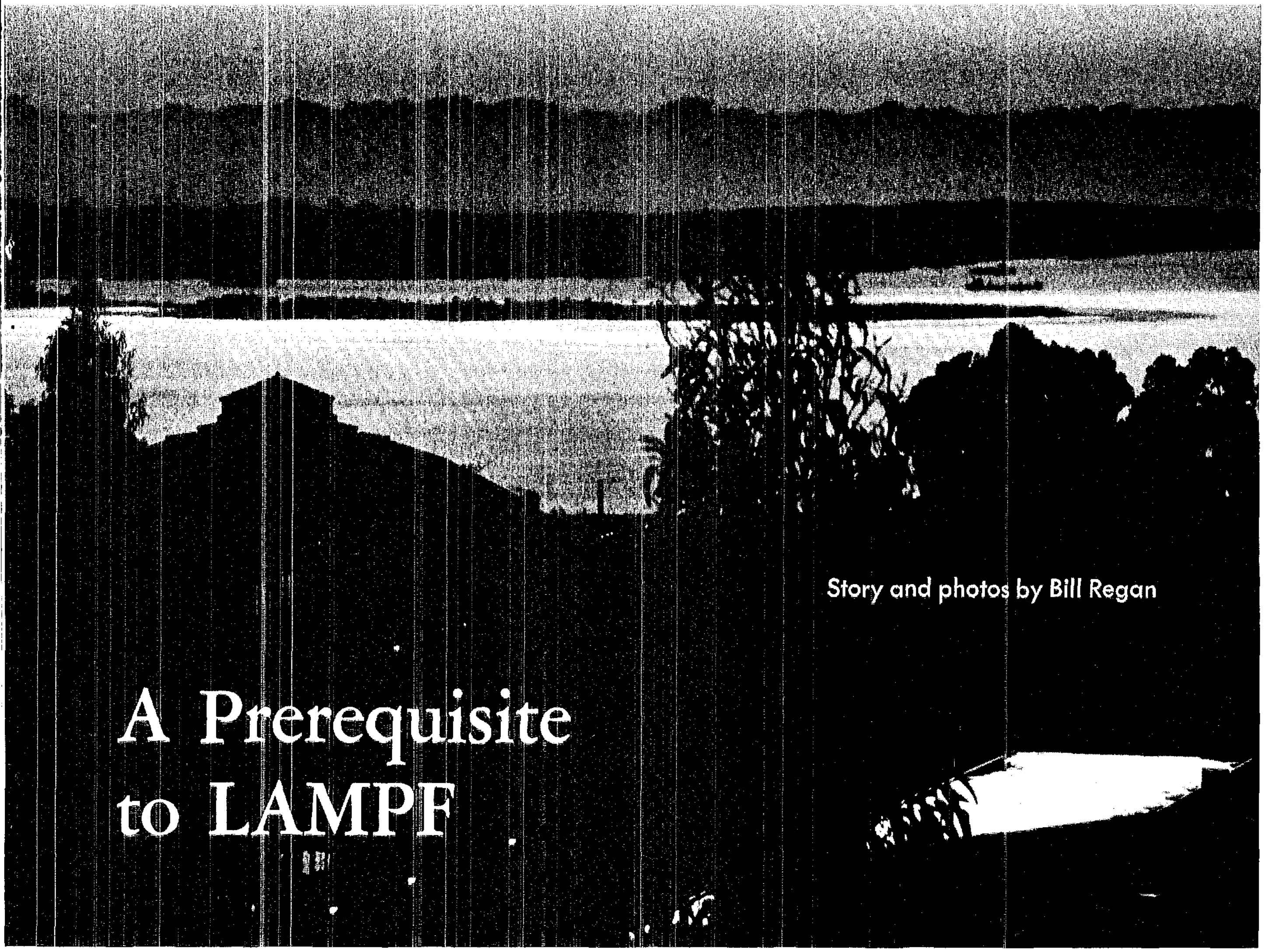
Office: D-413 Administration Building. Telephone: 7-6102. Printed by The University of New Mexico Printing Plant, Albuquerque.

Los Alamos Scientific Laboratory, an equal opportunity employer, is operated by the University of California for the United States Atomic Energy Commission.

Silhouetted against San Francisco Bay is the domed building that contains the historic 184-inch synchrocyclotron of the University of California's Lawrence Radiation Laboratory. Here, in the hills above the Berkeley campus, members of a research team from Los Alamos are midway in a two-months' experiment to procure important data on production of pions.

COVER:

A few of the 34 detectors/counters, used to discriminate pions from other particles in the 184-inch Berkeley synchrocyclotron's secondary beam, are shown in this upward view of the plastic scintillator array.



To return thence, by the way speediest,
Where our beginnings are.
—Sophocles

Sophocles' words, written more than 2,000 years ago, describe almost exactly what a group of physicists from the University of California's Los Alamos Scientific Laboratory is now doing at Berkeley.

Twenty years ago, Berkeley scientists detected the first mesons (a class of short-lived elementary particles) produced by man, using a 184-inch synchrocyclotron at the University's Radiation Laboratory.

Today, a LASL research team is using the same accelerator to acquire data important to the final design of experimental areas for a "meson factory" now under construction at Los Alamos. The meson factory, more properly called Los Alamos Meson Physics Facility (LAMPF), is proceeding on schedule for completion in mid-1972, but as MP Division Leader Louis Rosen em-

continued on page 2

A Prerequisite . . .

continued from preceding page

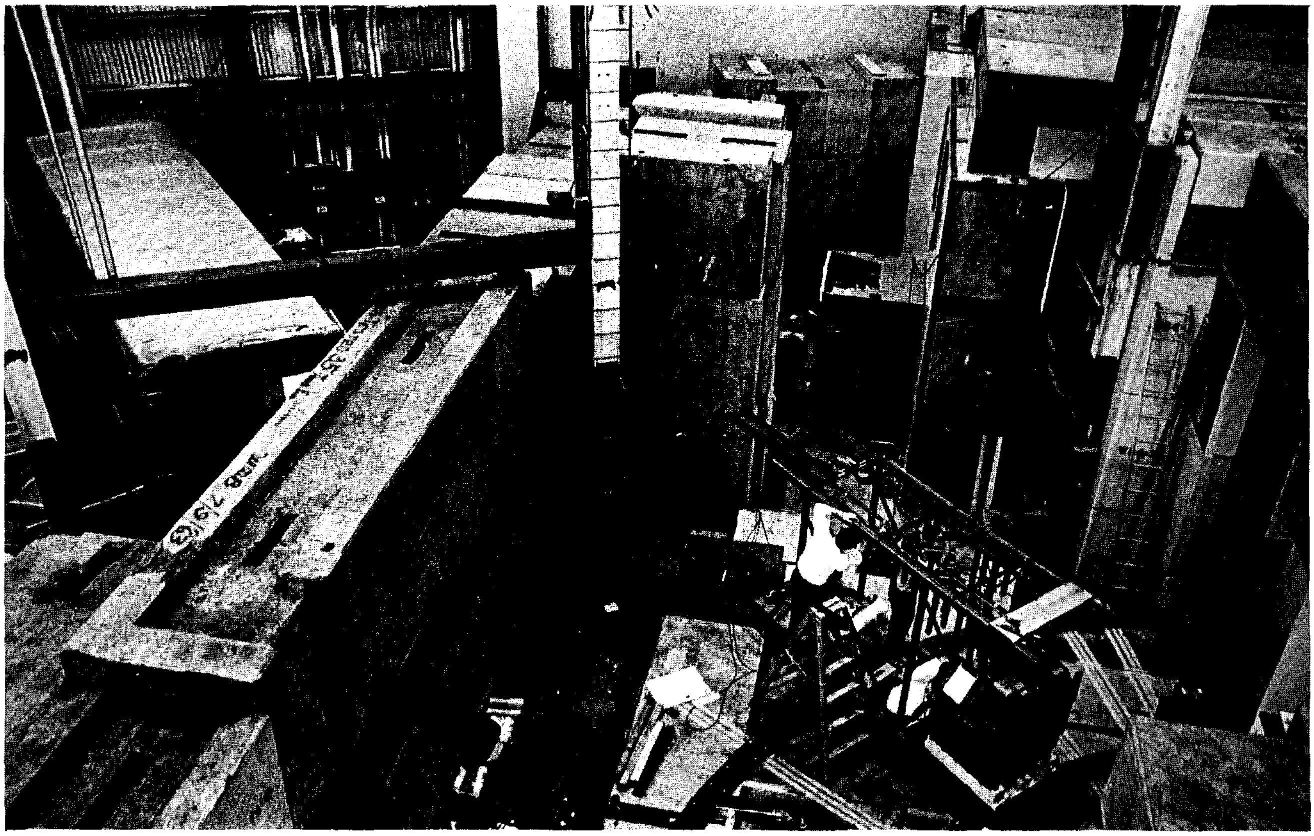
phasized at the January meeting of the LAMPF Users Group, "design of the experimental areas is a most immediate problem."

Design of experimental areas, particularly the secondary beam channels, requires refined data on pion (pi meson) production cross sections at various beam angles fanning out from the target position. At present, this information exists only for pion production angles of 0 and 20 degrees. However, the LAMPF experimental areas may require angles up to 90 degrees or more and, with secondary beam channels costing about one million dollars each, LAMPF designers are interested in optimizing them as carefully as possible. In addition to the benefits to be derived from cross section measurements, Rosen noted three other motivations for the Berkeley experiment, now at the mid-way point of two months' data taking:

1. Provide research physicists who are involved in construction (LAMPF) with some relief from their arduous "secondary task" and an opportunity to remain abreast of current developments in technology and research.
2. Acquire first-hand experience on problems involved in support of "outside experimenters" and on the solutions adopted at some of the foremost accelerator installations.
3. Initiate development of the type of instrumentation, especially on-line computer acquisition and analysis of data, which will be required at LAMPF.

In taking this experiment to the Radiation Laboratory's big atom smasher, LASL's pion production research team is not only returning to the birthplace of man-made mesons, but also to a facility whose history is tied most closely with that of Los Alamos. Construction of the big accelerator at Berkeley was planned before the beginning of World War II. But, opening of hostilities and the hectic events in the world of physics, triggered by the discovery of fission and the possibility of creating a new weapon of war from this source of energy, shelved the project for the duration. However, the 184-inch magnet

Overhead view of experimental area shows LASL trailer-laboratory, at left, where data is recorded. At right, behind heavy concrete shielding wall, is the detector rack toward which the secondary beam from the proton-cave target-area is directed.



E. Dennis Theriot, Jr., MP-4, and Roger Perkins, P-DOR, check diagram for installation of experimental equipment.

Robert Rajala, MP-4, strings the many cables which are the nervous system for the experiment. Cables run from the detector array in the experimental area to the trailer-laboratory where the impulses are fed into a computer.

was on hand and did play a vital part in experiments to produce enriched ^{235}U for the Manhattan District atomic bomb project which reached its focus at Los Alamos.

Nobel Laureate E. O. Lawrence, inventor of the cyclotron, led a research team at the Berkeley laboratory which attacked the problem of separating fissile ^{235}U from the more abundant ^{238}U isotope. Lawrence's group converted the Radiation Laboratory's 37-inch cyclotron into a mass spectrometer for electromagnetic separation of the two uranium isotopes on a very small scale. By Feb., 1942, three samples of about 75 micrograms each, containing 30 per cent ^{235}U, had been prepared.

Success of this first small experiment led to a series of refinements, such as a new C-shaped vacuum chamber called a calutron. Succeeding experiments used the more powerful 184-inch magnet to provide the field for more and improved calutrons, increasing the output of enriched ^{235}U so necessary for vital cross section measurements. This larger scale laboratory experiment was used to demonstrate the feasibility of the gigantic Y-12 electromagnetic separation plant at Oak Ridge. And it was enriched ^{235}U from the Y-12 plant that was delivered to Los Alamos for further purification and fabrication into the nuclear components for Little Boy, the first of the two atomic bombs which expedited the end of the war with Japan.

With the end of the war, Lawrence and the Radiation Laboratory returned to long-delayed

continued on next page

A Prerequsite . . .

continued from preceding page

plans for continuing the basic research for which the Berkeley institution had been renowned since its establishment in 1936. In Dec., 1945, the Manhattan District agreed to share the expense of completing the 184-inch cyclotron. And three years later it was this research facility which enabled scientists to produce and detect, for the first time in the laboratory, man-made mesons, the short-lived particle which had been detected previously only in cosmic rays.

This historic achievement ties in directly with the current LASL experiment to measure meson (in this case pi meson) production at various experimental angles with a precision never before attainable. Although the Berkeley cyclotron does not produce anywhere near the intense beam of pions that will be generated by the Los Alamos meson factory, data acquired can be used to predict the performance and provide information on the intensity and purity of pion beams which will be available from LAMPF.

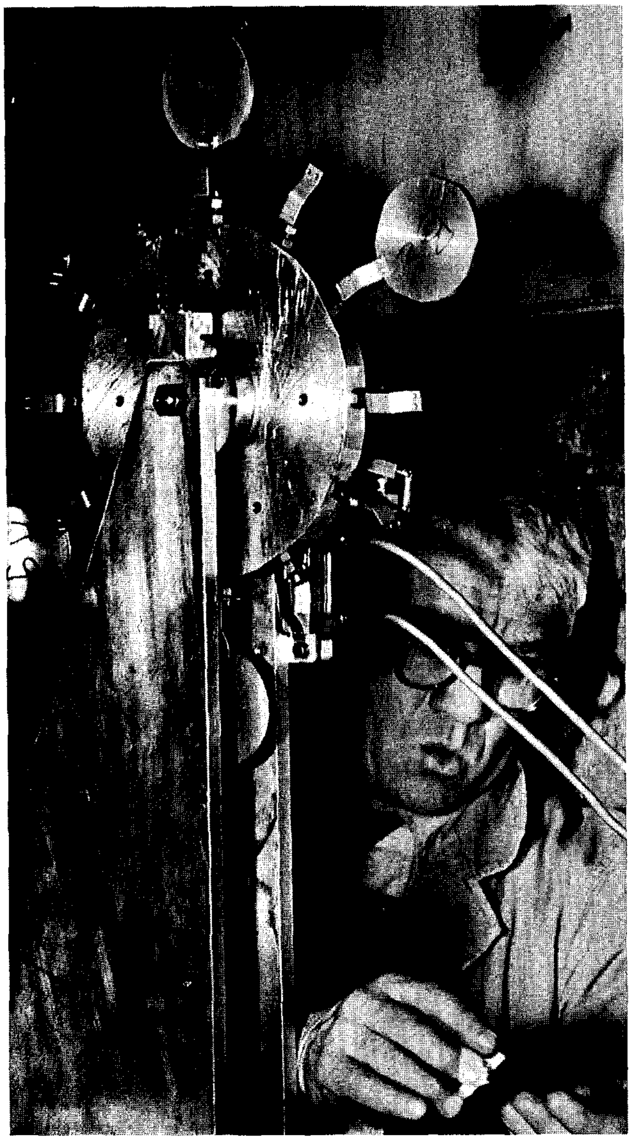
First discussions with Radiation Laboratory officials about obtaining necessary beam time and other support for the pion experiment took place nearly a year ago. Once agreement was reached, the necessary work to be accomplished was divided among LASL experimenters before moving to Berkeley.

Darragh Nagle, alternate MP-division leader, is directing the experimental effort and assisting Henry A. Thiessen, MP-4, and Roger Perkins, P-DOR, who are in charge of general planning. Almost everyone connected with the experiment assumed multiple duties and the three leaders were no exception. Nagle helped install targets at the cyclotron. Thiessen took over computer programming while Perkins designed the layout for energy measurements.

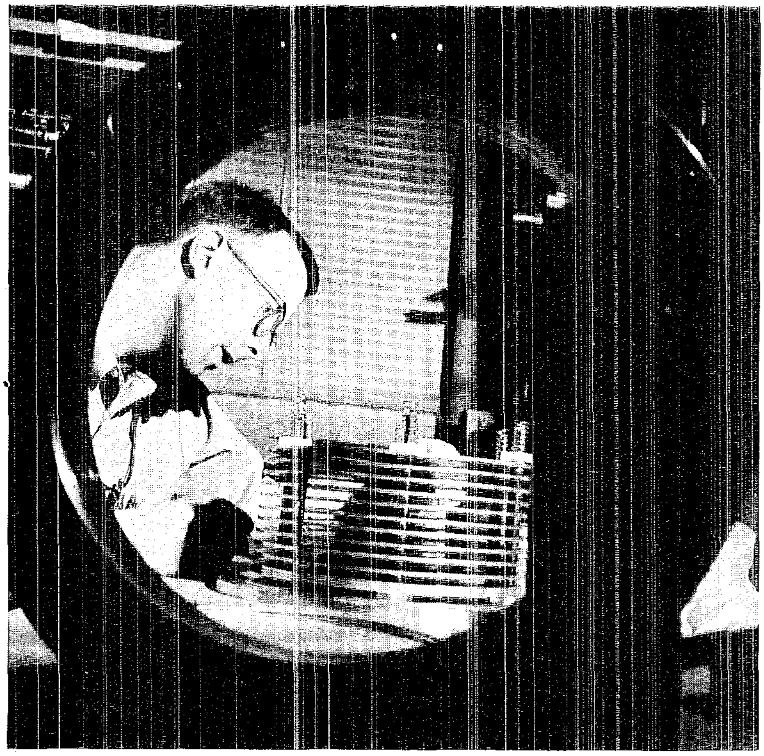
Edward A. Knapp, MP-3 group leader, supervised the building and installation of a gas Cerenkov counter. E. Dennis Theriot, Jr., MP-4, served as liaison man to iron out working details with the Radiation Laboratory people, and also helped with installation of detectors. Peter Gram, MP-6, was in charge of producing the beam monitors and plastic scintillation detectors. Don Cochran, MP-6, was responsible for targets. Phil Dean, H-4, joined Thiessen in work with the computer. Robert Rajala, MP-4, and William J. Shlaer, MP-3, have also participated in the experiment.

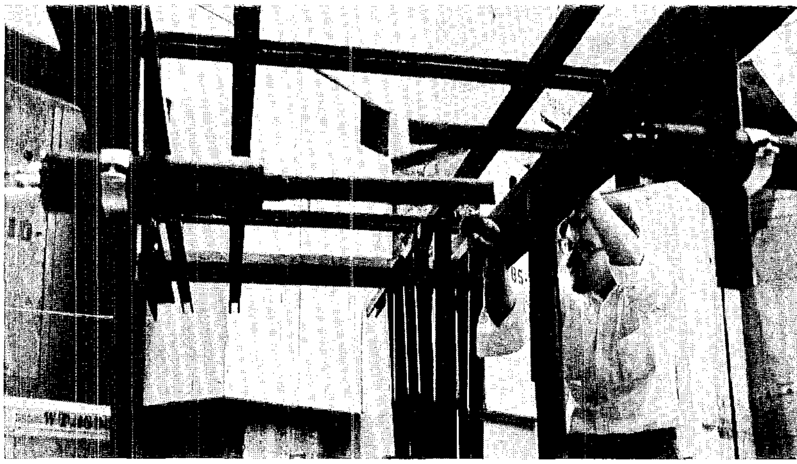
In October, most electronic equipment as well as a small computer was installed in a trailer-laboratory and moved into position to use the LASL Electron Prototype Accelerator for calibration tests of detectors and other equipment. After many delays because of illness among the team members and press of other duties connected with the overall LAMPF project, calibration tests ended in early January and equipment was shipped to the Radiation Laboratory. Thiessen, Theriot and Dean moved to Berkeley for the duration of the experiment and settled down to the more than a month-long process of aligning

continued on page 7



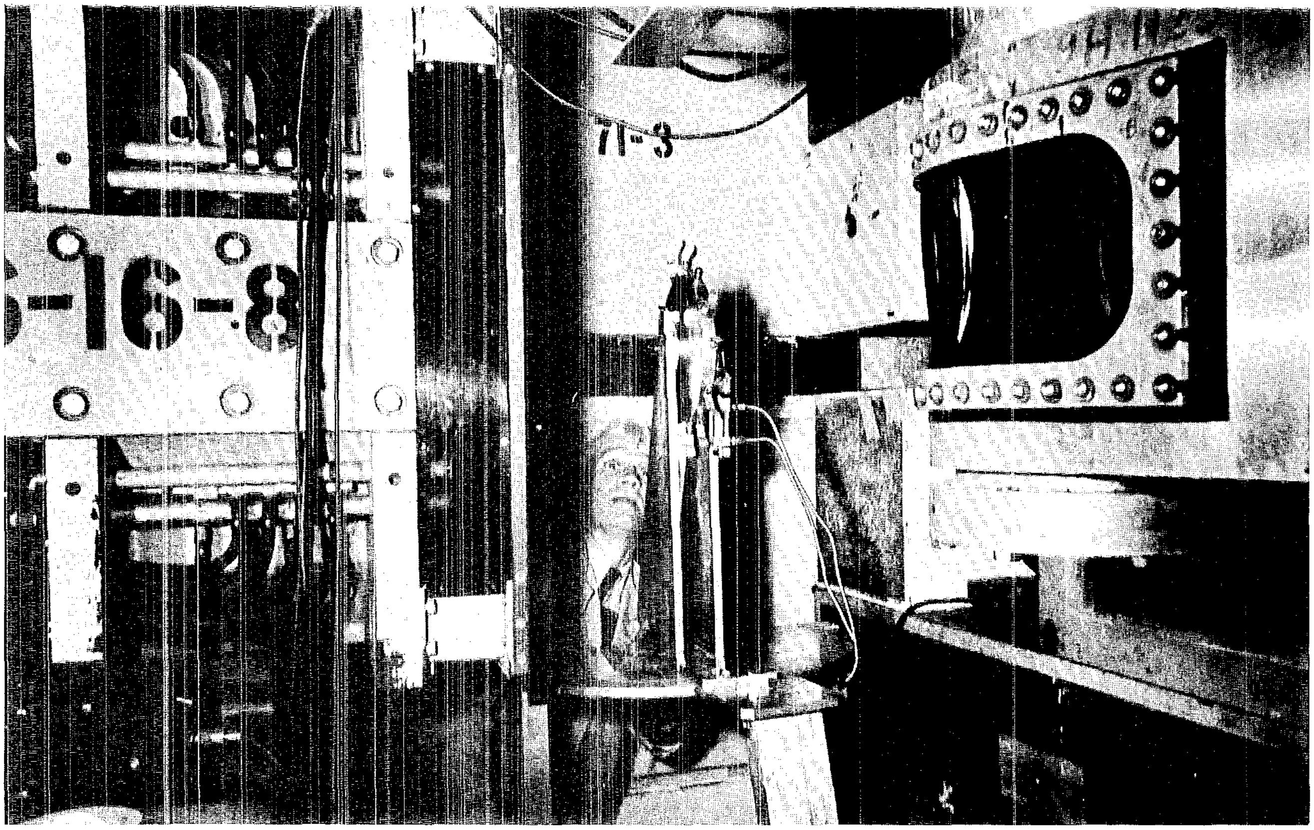
Nagle mounts target materials on changer wheel. Target discs are placed precisely in the proton beam line and aligned with the micrometer at left by silver (Ag) target.





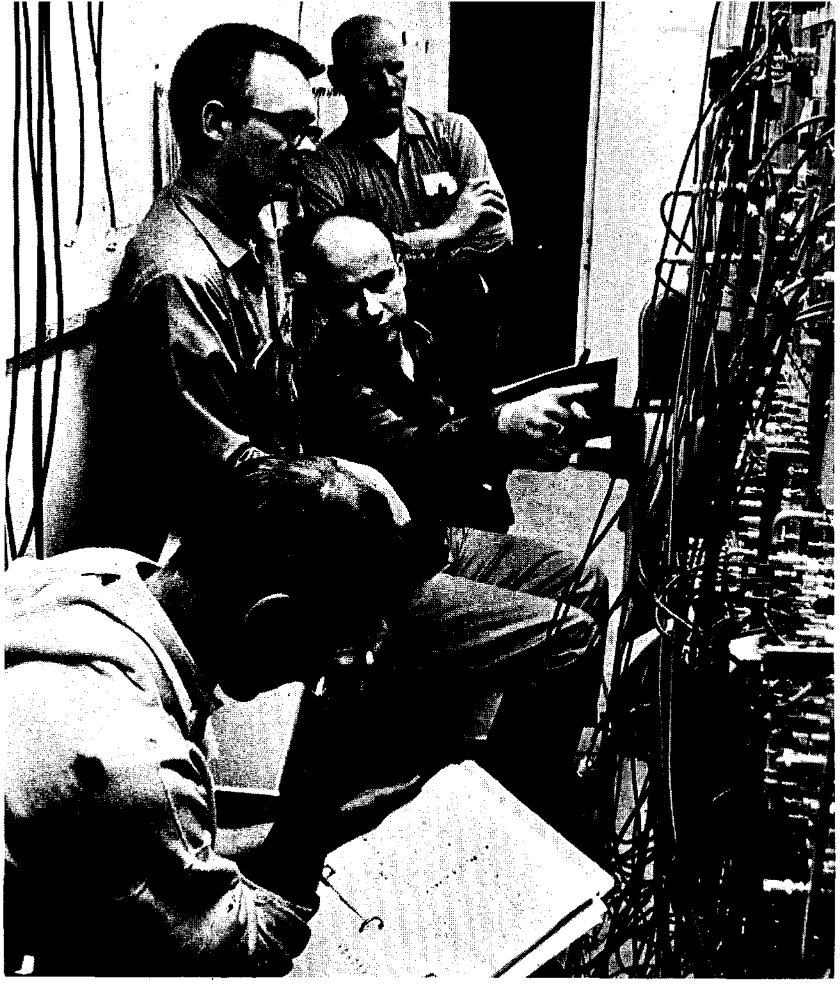
Theriot positions struts which will support 12 pairs of plastic scintillation detectors like those in the foreground.

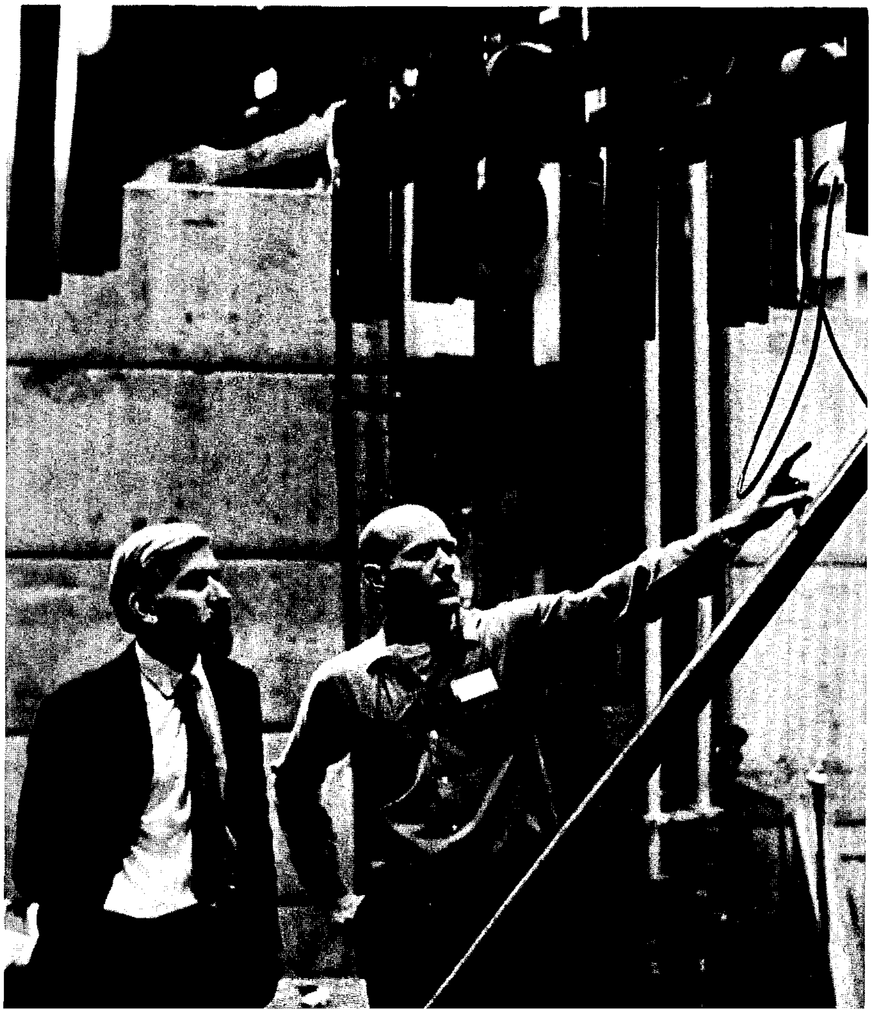
Peter Gram, MP-6, assembles plates for one of two ion chambers used as beam monitors. This instrument is now in position ahead of the target and tells LASL experimenters how many protons are hitting the target. The plate stack is placed in a can which is then filled with helium.



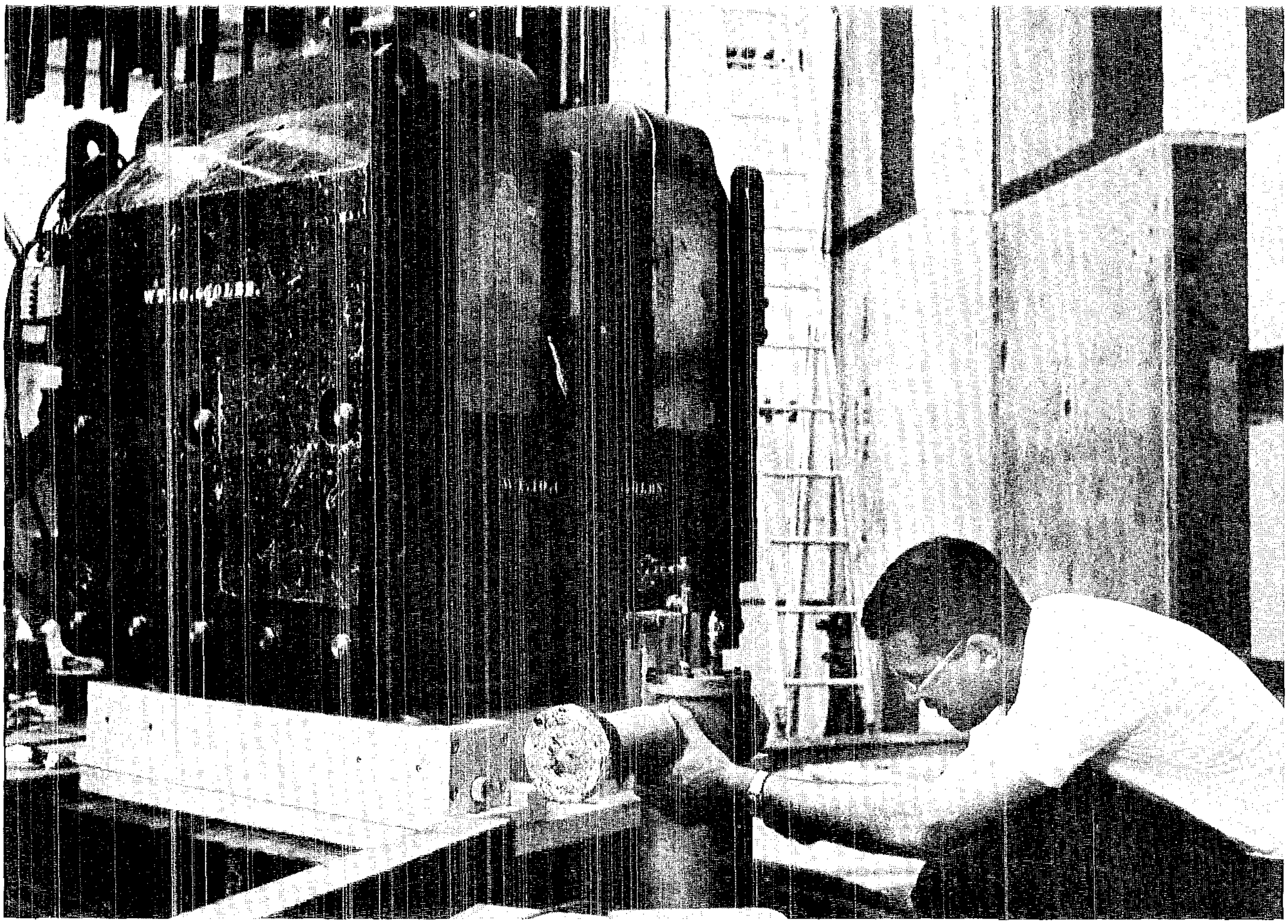
Darragh Nagle is not only providing direction of the experimental effort but in this case considerable physical support in placing the target changer in position in front of the cyclotron's doublet-quadrupole focussing-magnet. Liquid hydrogen target is contained behind the Kapton window in the metal object at right.

Henry A. Thiessen, MP-4, supervisor of computer programming for the experiment, points out a suggested change in the maze of electronics to Rajala. Gram, in foreground, and Phil Dean, H-4, at back, ponder their respective problems in the tedious process of tuning equipment in preparation for data taking.





Biophysicists Stan Curtis, LRL, and Dean meet at the experiment and discuss topics of mutual interest.



Edward A. Knapp, MP-3 group leader, unpacks a gas Cerenkov counter in front of the bending magnet which directs particles up to the detector array.

A Prerequisite . . .

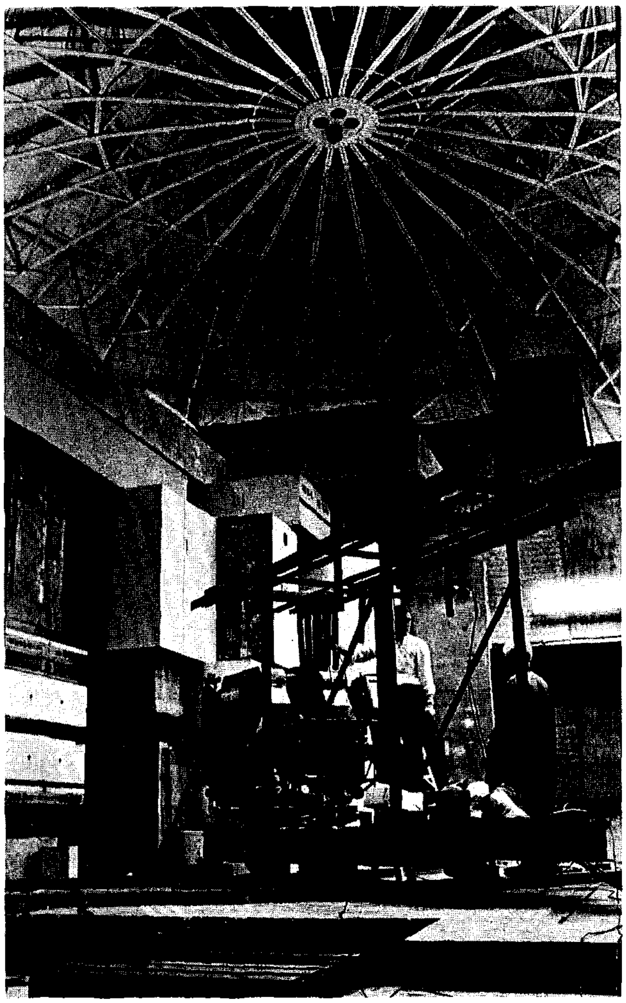
continued from page 4

equipment at the cyclotron and working bugs out of the electronics. Other LASL team members joined the operations at Berkeley as required for their special responsibilities and interest.

Following nearly three weeks of tuning and preliminary work, data-taking started the first week of March and will continue through April. Run periods usually consist of 48 hours or more of continuous beam time. After each satisfactory run period at a given experimental angle from the target, the massive rack containing the detectors and bending magnet is laboriously moved to the next experimental angle. When LASL scientists are again ready to take data and are assigned beam time, the experimental area behind heavy concrete shielding is sealed off with flashing radiation-warning lights and locked safety gates. The data takers return to the electronics-filled trailer laboratory and this sequence follows in the attempt to pick out pions—lifetime 2×10^{-8} second (2/100 millionths of a second)—from all the other particles making up the microstructure of matter.

Two LASL-installed beam monitors record the number of 730 MeV protons striking the target so that the data will show the number of pions produced as a function of the number of protons hitting the target. After the primary beam smashes into the target, the secondary particle beam which now contains principally electrons, protons, neutrons, as well as the desired and elusive pions, passes through channels in the median plane of the cave shield. It then hits a gas Cerenkov counter and two scintillation counters and finally enters a spectrometer magnet where it is bent upward into the vertical plane. Strategically placed detectors count the events in 12 different momentum channels simultaneously. The pions are picked out from all other

continued on next page



LASL's detector rack is dwarfed by the vast, umbrella-like dome of the LRL cyclotron building. Theriot and Nagle discuss placement of plastic scintillation detectors.

A Prerequisite . . .

continued from preceding page

particles by momentum analysis, time of flight, and also by dE/dx—the amount of energy deposited in each scintillator as the particle goes through. Time of flight for pions is very slightly shorter than that of the heavier protons.

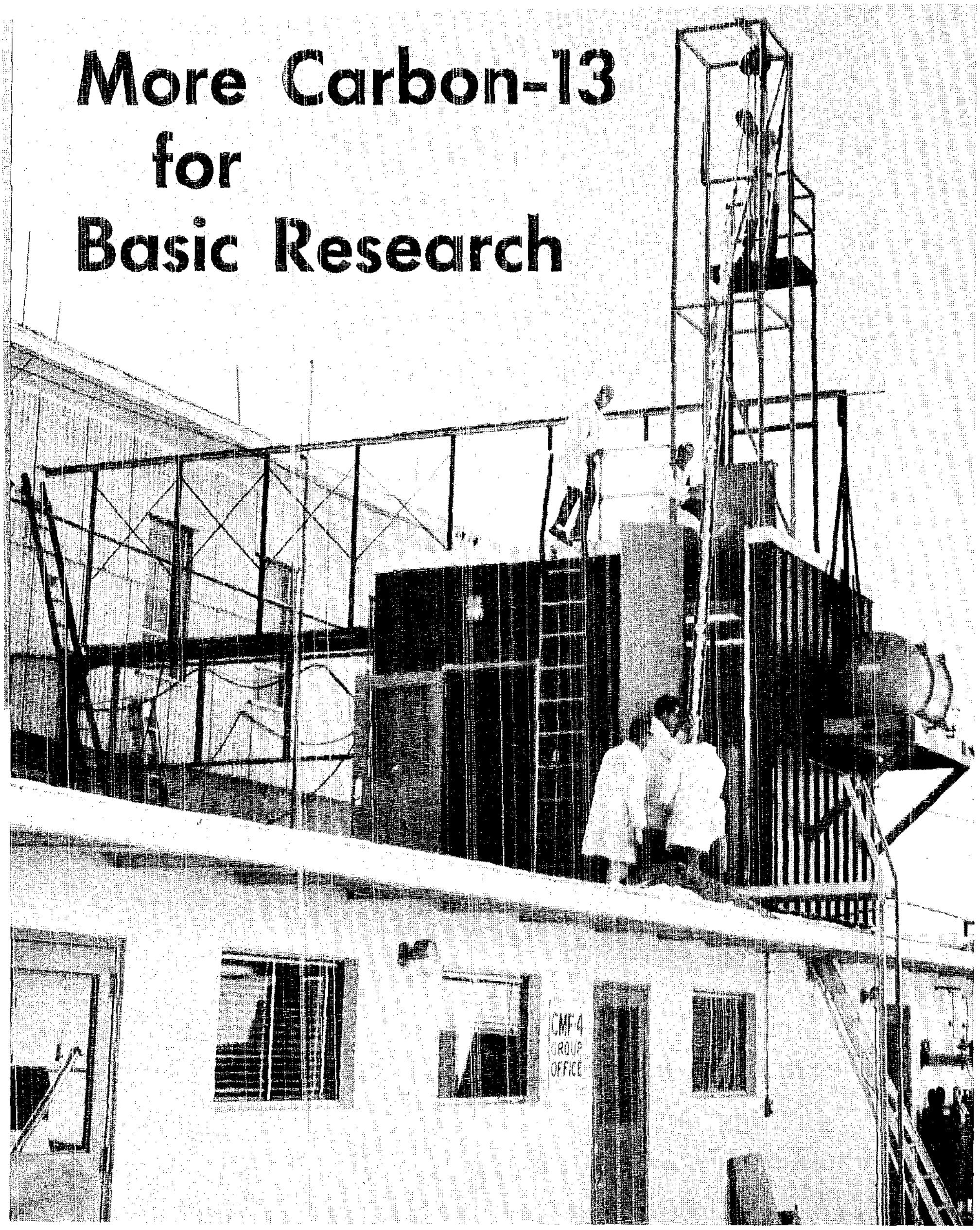
Two peak pulses are recorded, the later and higher peak (more energy loss) being recorded as a proton while the earlier is logged as a pion, providing it has passed all the preceding discrimination tests. For example, electrons are sorted out by the gas Cerenkov counter which compares particle velocity with the speed of light. A particle traveling through a medium (in this case methane gas—at 50-60 psi) at a velocity greater than the speed of light in the same medium produces a visible radiation caused by a kind of electromagnetic shock-wave effect. A sensitive photomultiplier tube sees the light and registers an output pulse. In this counter only the electrons are traveling at a speed greater than that of light in the counter medium. Therefore, events with a pulse in this counter are called electrons by the computer.

This sort of data acquisition will continue for another month. Measurements will be made using 11 targets—liquid hydrogen, beryllium, carbon, aluminum, titanium, copper, silver, tungsten, lead, tantalum and thorium. Production angles from 15 through 150 degrees will be investigated.

In addition to investigating pion production from nuclei, LASL physicists will be using the hydrogen target to look at the "more elementary" process of pions produced in nucleon-nucleon collisions. Theoretical calculations of the cross sections to be expected in this case are being provided by Charles T. Grant, Mario E. Schillaci and Richard R. Silbar, all of group T-9.

When the data is all reduced, engineer-designers will be given a much needed assist in laying out the LAMPF experimental areas and another meaningful experiment in basic particle physics will be added to the store of man's knowledge of what goes on in the unseen world of the nucleus.

More Carbon-13 for Basic Research



A CMF-4 crew of six prepares to lower a single-column section into the hole in the ground that will contain the distillation plant. At bottom are Robert Pruner, Joe G. Montoya and Esequiel Salazar. At top are Francis Schmahl, Ramon Romero and R. C. Vandervoort.

By KEN JOHNSON

Carbon-13 has had limited usage in basic research because of its high cost associated with limited availability. But, with the completion of a new production capability at the Los Alamos Scientific Laboratory this year, greater quantities of the isotope will be produced at greatly reduced cost.

This capability will consist of three sophisticated distillation plants being built by CMF-4, two of which will produce 95 per cent carbon-13. The third will be capable of enriching the refined carbon isotope to 99 per cent.

The first plant is expected to be in operation this month. It will have a capability of producing approximately four kilograms of 95 per cent enriched carbon per year.

Most of the substances that make up the human body and other living organisms are compounds of carbon. This is why the various isotopes of carbon are useful as basic research tools. Of natural occurring carbon, 98.9 per cent is made up of carbon-12 and 1.1 per cent by carbon-13. Therefore, the effects of carbon-12 in living organisms are well known insofar as the chemical techniques available for analysis are concerned and there would be little profit in studying the reaction of additional carbon-12 in living systems.

Carbon-14 has been used in studying reactions in living organisms, but its application is sometimes limited because it is radioactive. Carbon-13, however, is stable and would have application where use of a radioactive isotope is undesirable.

A characteristic of value in tracing and determining carbon-13's reaction in living organisms is that it is magnetic and is detectable by nuclear magnetic spectrometers. The development of magnetic resonance techniques of analysis would, in addition to determining the amount of carbon-13 present, reveal information about the chemical environment of the carbon-13 atom. Chemical analysis to determine its location in molecules, as is required in carbon-14 tracer studies, would often be unnecessary. Its unique properties would also be expected to afford other information regarding chemical structures and reactions, not attainable with other carbon isotopes.

H-4 is proposing a project in which toxicity studies would be performed on generations of mice whose carbon content would be made up of much greater amounts of carbon-13 than normal. Enriched carbon monoxide would be converted to acetate by H-4 organic chemists. It would be the carbon source for growing large quantities of yeast by H-7. The yeast would

continued on next page

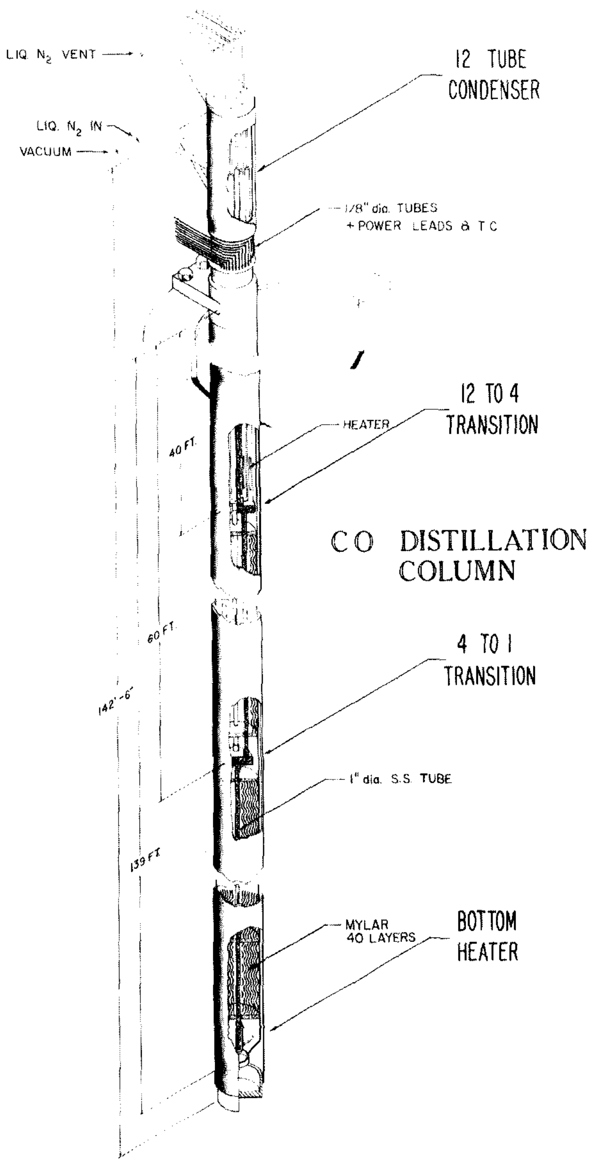
More Carbon-13

continued from preceding page

then be fed to the mice by H-4 biologists and magnetic resonance studies would be conducted by CMF-4.

The purpose of the toxicity studies proposed by H-4 is to determine if high levels of carbon-13 have any adverse or toxic effects in living systems, to enhance production of the isotope and show its utility in basic research. All types of carbon-13-labeled compounds of biological interest would be isolated from the yeast and mice for use in other studies.

The source of carbon-13 for the LASL distillation plant will be carbon monoxide gas. This gas boils and liquifies at about -192 degrees centigrade, which will be brought about by cooling the plant with liquid nitrogen.



Distillation is dependent on differences in boiling points and vapor pressures of materials to be separated. Each liquid exerts a vapor pressure depending on the relative amounts of each. The lower boiling constituent will have a higher vapor pressure and more of it will be in the vapor phase than in the liquid. Carbon-12 and carbon-13 have only slight differences although the boiling point of carbon-12 is slightly lower and its vapor pressure slightly higher than carbon-13. Thus, the carbon monoxide vapor will have a larger amount of the lower-boiling carbon-12, but there will also be a portion of the higher-boiling carbon-13 in the vapor. If this vapor is condensed back into liquid form, its vapor will contain even more carbon-12 and less carbon-13. This process, known as fractional distillation, is repeated, and subsequent fractions combined to be redistilled time after time so that both constituents will be obtained almost pure.

Materials such as carbon-12 and carbon-13, hard to separate because of similar boiling points and vapor pressures, normally require much longer distillation towers than those that are easily separated. Normally, a single column for the separation of these two isotopes would have to be about 250 to 300 feet in length and about five inches in diameter. But based on approximately 10 years of experience with another distillation plant, CMF-4 has found that optimum characteristics can be obtained when a portion of the distillation activities function side by side using columns one inch in diameter.

By incorporating these principles, the scientists have been able to limit the length of the carbon-13

Cutaway drawing shows the construction of the carbon monoxide distillation column. The condenser, shown above the casing, is contained in the control room.

Heaters that will vaporize the liquid carbon monoxide are emplaced in one of the distillation tower's 12-column sections by Montoya, right. In foreground at left is Robert Potter. To rear are Arthur Briesmeister and Dale Armstrong.

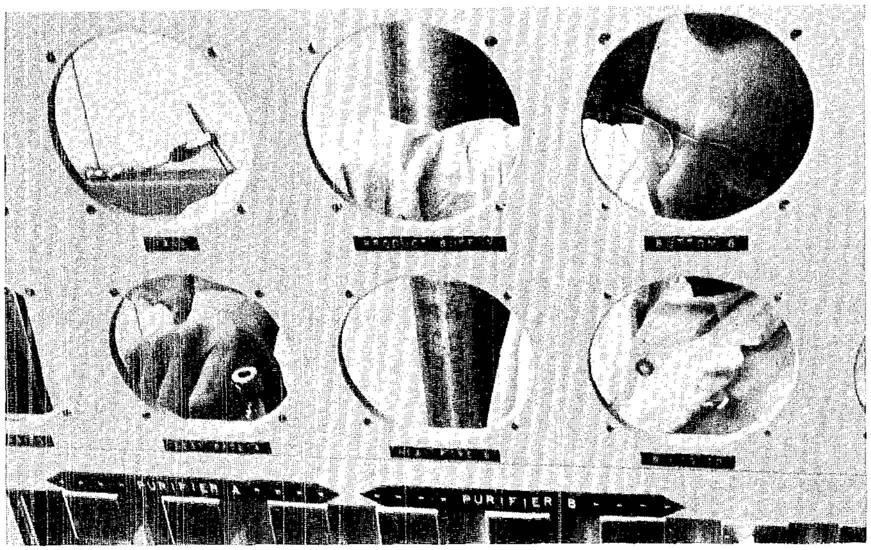
tower to 140 feet. It is put together in seven 20-foot sections. The lower four sections are made up of single columns. The fifth section, linked by a manifold, has four parallel columns and the two upper sections have 12 parallel columns each. Each of the 12 columns has its own condenser which is surrounded by liquid nitrogen. The columns are contained in a six-inch vacuum jacket normally used for insulation at low temperatures.

Traditionally, one of the greatest costs of long distillation columns is a structure to contain it. CMF-4 has found an inexpensive solution to the problem by housing the apparatus in a hole in the ground. An 18-inch casing in the hole runs upward through the two stories of a new addition to Building 3 at DP site to a small building on the roof which will be used as a control room. In it is a mass spectrometer that will keep tabs on the ratio of carbon-12 to carbon-13 during the separation process.

The development of a capability to produce greater quantities of carbon-13 was in the planning stages by CMF-4 when the Atomic Energy Commission's Division of Biology and Medicine became interested in its potential as a research tool. At the behest of the AEC, planning and development of the project was accelerated. Construction began in November.

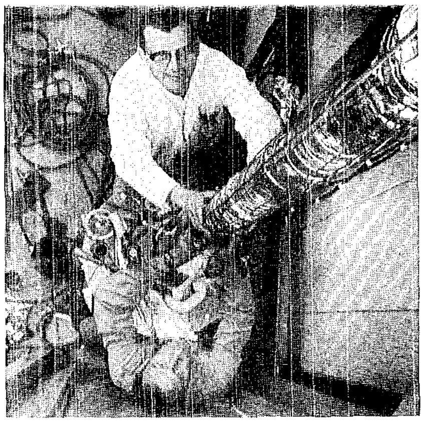
The Division of Biology and Medicine felt carbon-13 would be used widely in medical, biological and chemical research if the cost per gram could be reduced. At the time, the isotope, at various levels of enrichment, was selling at prices ranging as high as $4,000 per gram.

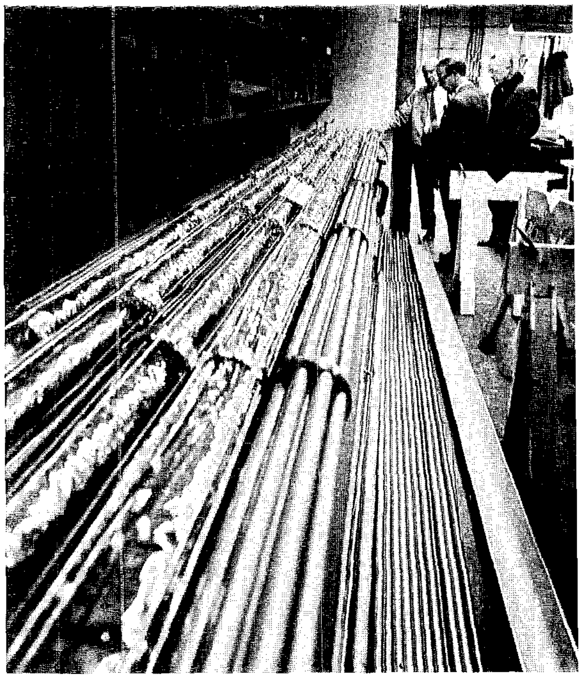
Los Alamos was selected as the site for the project because its CMF-4 personnel had considerable experience in low temperature distillation. From the distillation tower presently under construction, enriched carbon monoxide containing 95 per cent carbon-13 and depleted carbon monoxide with four-tenths of one per cent carbon-13 will be extracted. The enriched carbon will be stored in pressure tanks in the form of carbon monoxide gas, but can be converted and made available to users in the form of carbon dioxide.

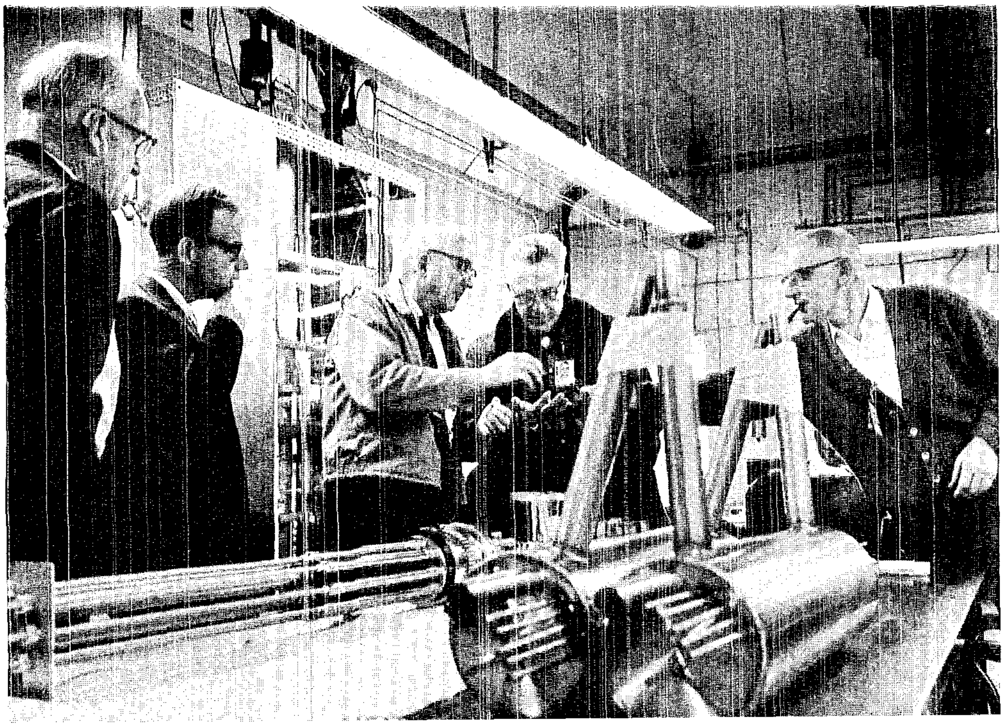


Working behind skeleton of the control panel is Vandervoort. When completed, the holes in the panel will be plugged with the appropriate instrumentation.

From a hole in the roof of the control room, a section of the distillation tower protrudes. The tower goes through the control room, the CMF-4 building and into a hole in the ground. Working in the control room are Vandervoort, top, and Romero.



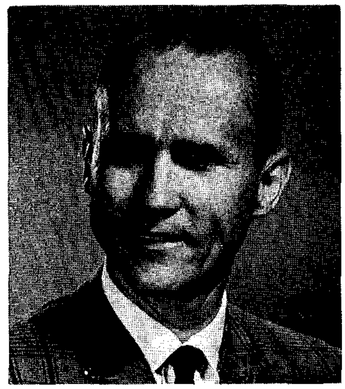




Norris E. Bradbury, Laboratory director, and Raemer E. Schreiber, technical associate diector, witnessed the lowering of the first sections of the distillation plant. In foreground, above is B. B. McInteer whose section is fabricating the plant. Below, looking at condenser, on table at left, and purifiers that will take impurities out of the carbon monoxide are Robert D. Fowler, CMF-division leader, McInteer, Bradbury, Schreiber and Eugene Robinson, CMF-4 group leader.

Two From LASL Named Lawrence Award Winners

Don T. Cromer



F. Newton Hayes

Los Alamos scientists Don T. Cromer and F. Newton Hayes are two of five selected to receive the Atomic Energy Commission's coveted Ernest Orlando Lawrence Memorial Award for 1969.

Recipients are selected by the AEC upon the recommendation of its general advisory committee and with the approval of the President. Each award consists of a citation, medal and $5,000. They will be presented in a ceremony April 30 at the Carnegie Institute in Washington, D.C.

The award was established in December of 1959 by the Commission to perpetuate the memory of the late Ernest O. Lawrence, inventor of the cyclotron and director of the Radiation Laboratory at Berkeley which now bears his name. The first recipients were selected in 1960.

The Lawrence Award is made to not more than five recipients in any one year in the amount of not less than $5,000 each and not more than a total of $25,000. It is made in the spring of the year to men and women not more than 45 years of age who are citizens of the United States and who have máde recent, especially meritorious contributions to the development, use, or control of atomic energy in areas of all sciences related to atomic energy, including medicine and engineering.

Cromer and Hayes bring to nine the number of LASL employees to receive the Lawrence Award. Recently-retired T-4 Group Leader Conrad L. Longmire was the first from the Laboratory to receive it in 1961. Louis Rosen, MP-division leader, and James M. Taub, CMB-6 group leader, were recipients in 1963; George A. Cowan, J-11 group leader, 1965; Harold M. Agnew, Weapons division leader, and Ernest C. Anderson, H-4 Cellular Radio-biology section staff member, 1966; and Robert Thorn, T-2 group leader, 1967.

Cromer is section leader of the CMF-5 Crystal Chemistry section. His citation reads: "For his outstanding contributions to the understanding of the structures of many intermetallic compounds of plutonium and other transuranic elements of great importance to the reactor and weapons programs."

He was born in South Bend, Ind., July 27, 1923. He received the B.S. Degree from the University of Wisconsin in 1947 and the Ph.D. in 1951, also from the University of Wisconsin. His first employment was with the Titanium Division of the National Lead Company at South Amboy, N.J., where he spent two years doing x-ray work on pigments.

In 1952, Cromer joined the scientific staff at the Los Alamos Scientific Laboratory as a crystallographer in the Plutonium Metallurgy group.

He has been leader of the Crystal Chemistry section of CMF-5 for more than 10 years. Under his direction, this section pioneered in the use of modern computers in determining crystal structures, and has produced computer programs that are in use in many laboratories throughout the world. He has been an important contributor to the first efforts to calculate the electronic structure and, thereby, predict some of the properties of the undiscovered elements having very high atomic numbers.

Cromer's determinations of the crystal structures of intermetallic compounds number over 50 and represent significant contributions to the entire scientific community as well as to the weapons and reactor programs of the Atomic Energy Commission. In particular, his work on plutonium intermetallic structures has been of special importance, and he is a foremost authority in this field today.

He has distinguished himself in the field of x-ray crystallography and has significantly extended crystallographic methods through improved computer programs and refinement of scattering factors and dispersion corrections. He has collaborated effectively and productively with many scientists of diverse interests, and his efforts have extended into areas of physics, chemistry, metallurgy and mathematics.

Cromer is a member of the American Chemical Society and the Crystallographic Association. He is married and has five children. The Cromers live at 194 Tunyo Street.

Hayes is section leader of the H-4 Molecular Radiobiology section. His citation reads: "In recognition of his fundamental contributions to the development of scintillation counting which have been essential to the advancement of radiobiology and radiochemistry."

Hayes was born in Shanghai, China, of American parents, April 25, 1924. He continued his education in the United States where he received the Degree of A.B. from Yale University in 1944 and Ph.D. in organic chemistry from Northwestern University in 1948.

After teaching for two years in the Department of Chemistry at the Illinois Institute of Technology, he joined Group H-4 at the Los Alamos Scientific Laboratory.

His major investigations include the scintillation properties of a variety of heterocyclic organic compounds and the application of these to the quantitative detection of radioactivity by scintillation counting in liquid and solid phases.

In the liquid phase, these techniques have made possible the accurate measurement of extremely small amounts of low-energy-emitting radioisotopes such as carbon-14 and tritium. Although applicable to many other radioisotopic measurements, the ease and precision with which these two isotopes may be measured through liquid scintillation counting have greatly accelerated the extension of fundamental knowledge in medicine and biology generally.

Hayes' research is presently directed to basic problems of information transfer in biological systems.

He is a member of the American Association for the Advancement of Science, the American Chemical Society and the British Chemical Society.

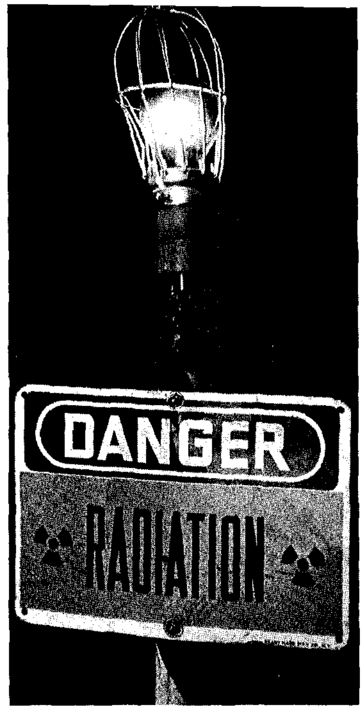
Hayes and his wife have four children. They live at 119 Canyon Vista.

Others to receive the award are Geoffrey F. Chew, head of theoretical physics at the Lawrence Radiation Laboratory and professor, University of California; Ely M. Gelbard, consultant, Reactor Theory department, Bettis Laboratory, Westinghouse Electric Company, Pittsburgh, Pa.; and John H. Nuckolls, associate leader of A division, Lawrence Radiation Laboratory.

Chew: "For his imaginative and creative contributions to progress in a wide range of problems in nuclear and elementary particle physics and for his inspiring leadership which has provided the driving incentive to senior scientists as well as to young students working in his field."

Gelbard: "For outstanding creative contributions in the development of modern methods of the design of nuclear reactors and for his deep insight into physical processes, his mastery of computational techniques and his effective application of theoretical models to important problems and experiments."

Nuckolls: "For his contributions to the design of high efficiency thermonuclear devices, including minimum-fission explosives applicable to the Plowshare excavation program, and for the development of techniques for predicting nuclear explosive-ground interaction."



H-1's Health Physics Surveyors

By Bill Richmond

Ionizing radiation is unseen, unfelt, and at times potentially dangerous.

But if it can't be seen or felt, how can those persons who have to work around it be protected?

At the Los Alamos Scientific Laboratory a major role in this job of protection is furnished by the health physics surveyors, also known as "Monitors." There are about 50 of them under the direction of H-1 Group Leader Dean Meyer. Their primary job, Meyer said, is to "check the work environment of LASL personnel, looking for signs of unsuspected radioactivity." They determine the magnitude of radiation and advise people in the area as to the potential exposures involved.

Before the monitors enter the scene, it must be assumed that the basic safety precautions regarding ionizing radiation have been met. This includes the engineering of a building to be certain all radiological safety requirements are adhered to and the assurance that the equipment to be used is of the proper type for the particular job. H division reviews all blueprints for new buildings, or modifications to existing structures, to ensure that plans conform to the applicable codes and regulations.

In addition, the workers themselves are responsible for knowing the required safety techniques and following them at all times. And one of the jobs of a supervisor is to make sure those people under his direction observe the approved radiation safety practices.

The body can receive radiation exposure in two basic ways: (1) Penetrating, such as by x rays, gamma rays and neutrons, and (2) Contamination, such as from leaks in a laboratory glove-box enclosure.

"H-1 is an advisory group," Meyer said. "The supervisor of an area is informed of the conditions and then it is his responsibility to decide what action he wants to take. For example, he may call for extra shielding. Fortunately, we have the full cooperation of all group and division leaders in respect to the advice offered. The monitor's job couldn't be done properly without this cooperation."

A monitor has to know what the acceptable levels and effects of the different radioactive materials are on people. These will vary depending on the material. Monitors also become extremely efficient in suggesting control measures. Through experience they learn the effectiveness of the various types of radiation shielding and how to best protect personnel from radioactivity.

The body can receive radiation through induced activity and from radioactive isotopes. An example of induced activity is neutrons striking a material and turning it into a radioactive source; while radioactive isotopes are such as those of plutonium and uranium.

Normally, the presence of a radioactive isotope in a working area is known by all those working there. However, contamination may be the result of a radioactive "spill," or other accident, and not be known until discovered by the monitor. For this reason, the monitor is always on the alert to check for radioactivity in likely and unlikely spots.

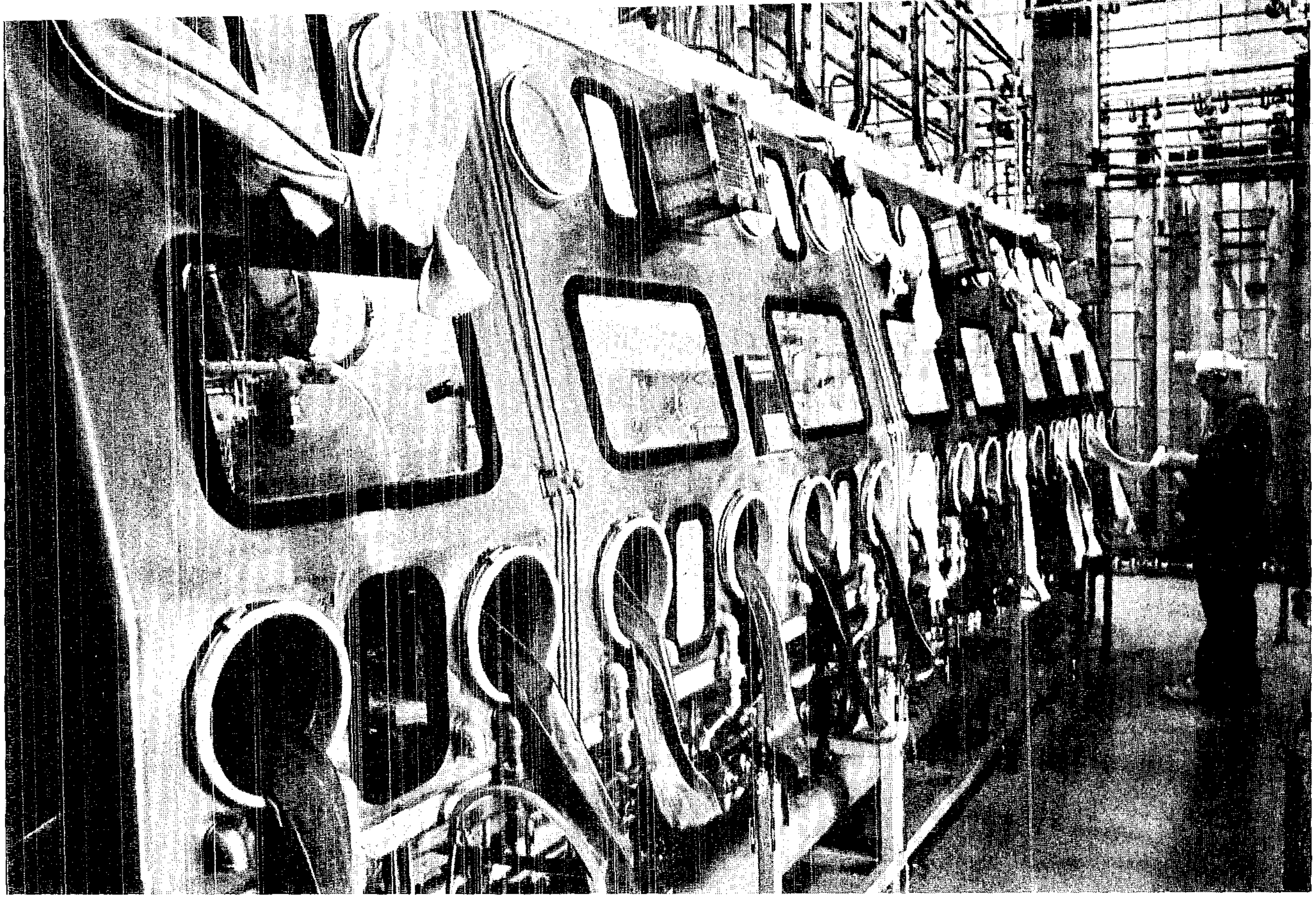
Monitors are permanently assigned to a number of Laboratory sites, such as DP, CMR building, Omega site, and several others. Each site has different problems since a variety of work is being conducted with radioactive materials or devices that produce radiation. The monitors are thus concerned with a variety of details.

"A good monitor has a pretty fair idea of everything going on in his area to better protect the workers and people in the area," Meyer said.

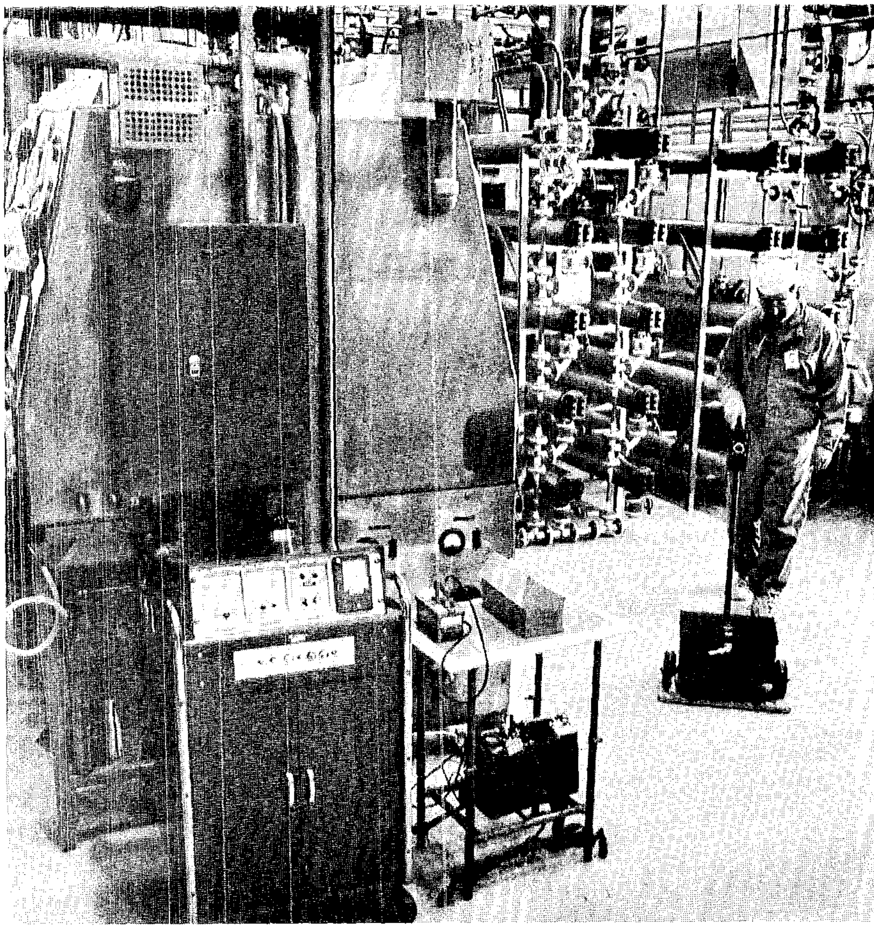
In addition to the permanently-assigned monitors, others make periodic checks at certain selected sites and are "on call" when needed and requested by groups working with radioactive materials.

Occasionally the monitors will discover contamination in an area but are not immediately able to determine exactly what type of radioactive nuclide is present. In this case they will bring a sample to the H-1 laboratory in the Administration building for a test. For example, by using an alpha detector the monitor may pick up some alpha emitters. However, he may not be sure exactly what the source is so he will take a "swipe" (wiping the contaminated surface with a

continued on page 16

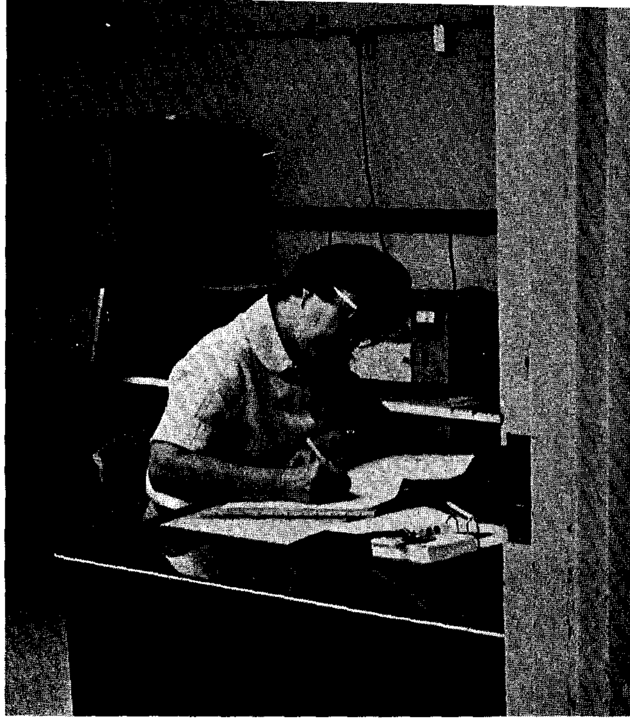


Jose G. Lopez, monitors a glove-box enclosure at DP West to ascertain there are no pinhole leaks in the gloves which could cause contamination of workers.



John D. Harrison, Jr., manipulates a floor monitor at DP site. In the foreground is one of 350 air samplers used by H-1 which automatically records airborne radiation. The filters in these samplers are periodically read by H-1.

Monitoring the area in which a million-volt x-ray machine is used at GT site is a function of H-1. Here, Bill Babich performs that service.



Virginia Johnson records readings from the air samples taken at DP West. Some of these samples are on the racks at right. In back of her are counters used to determine the level of radioactivity, if any, of the samples.

Health Monitors . . .

continued from page 14

clean piece of cloth) and bring the swipe to the laboratory where it is placed in an alpha spectrometer and identified. The reason behind this is that the permissible levels will vary depending on the source.

In addition to protecting the health and working environment of LASL personnel, the H-1 monitors also perform a variety of jobs to guarantee that no person outside the Laboratory is exposed to contamination which originated within the Laboratory. One of these jobs is monitoring all outgoing shipments that contain radioactive materials. The monitors check these shipments for possible leaks and also check the trucks and planes bringing shipments in to be sure they are not contaminated in excess of established legal limits.

Another routine—but important—job of the monitors is to check vehicles in the main motor pool to insure that they have not been contaminated during use in one of the areas using radioactive materials. In addition, since the Zia shops are in a "clean" area, some vehicles must be monitored before going in for repair or maintenance. All vehicles sold to the public, as well as materials going to salvage, are monitored for possible radioactivity.

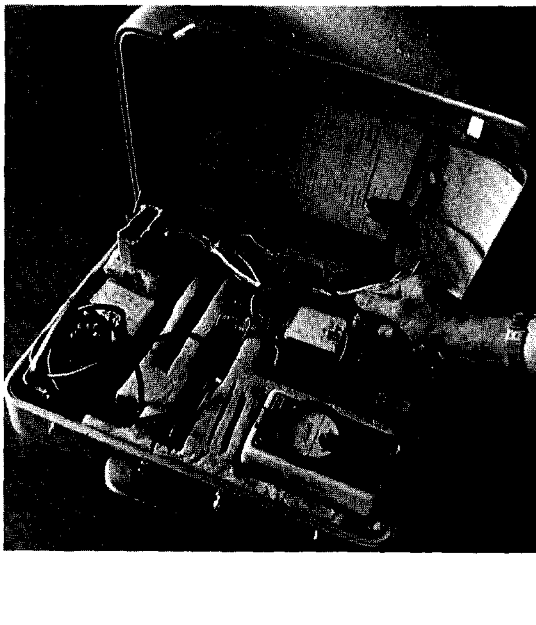
A number of instruments are used to check an area for radioactivity. The field instruments used by the monitors can detect one-thousandth of a microgram of ^{239}PU as contamination.

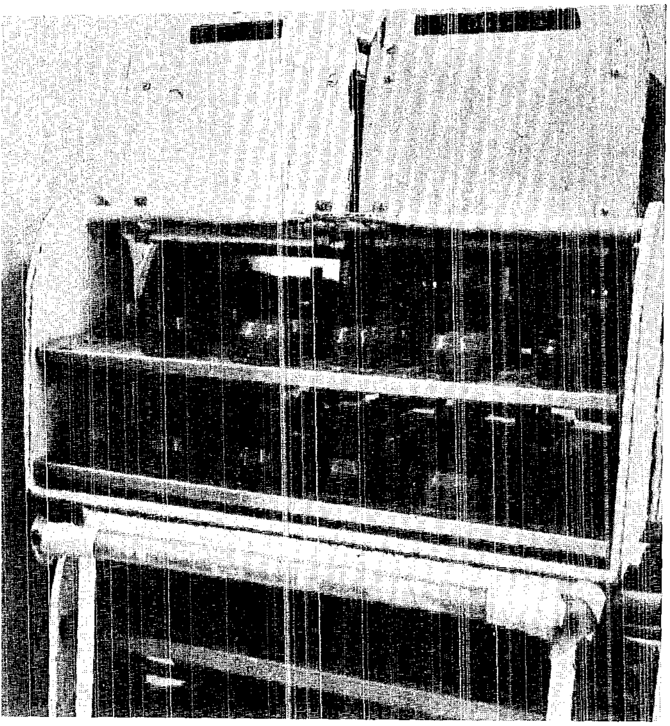
H-1 also has about 350 air samplers—some are permanently placed while some are portable and can be wheeled to various locations. The filters in the air samplers are periodically checked to determine what level, if any, of airborne radioactivity has been present and total dosage.

"One of our greatest concerns," says Leo Chelius, H-1 alternate group leader, "is that of people breathing radioactive particles. This could be potentially hazardous."

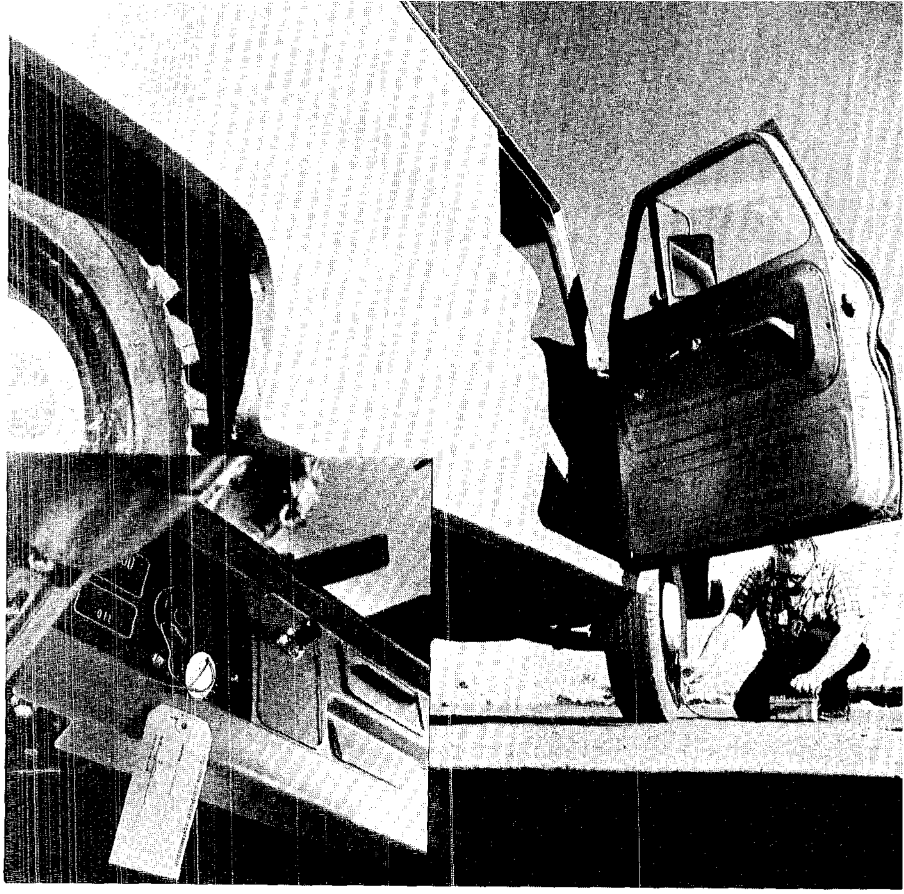
In essence, the health physics surveyors must protect against direct radiation, contamination and air concentration.

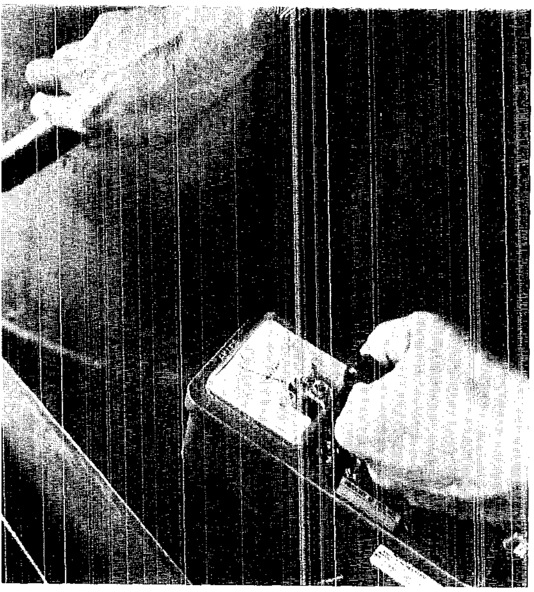
Below, a briefcase-size monitoring unit used by H-1 contains several portable detectors and tags for marking radioactive material. How a detector is used is illustrated at right.

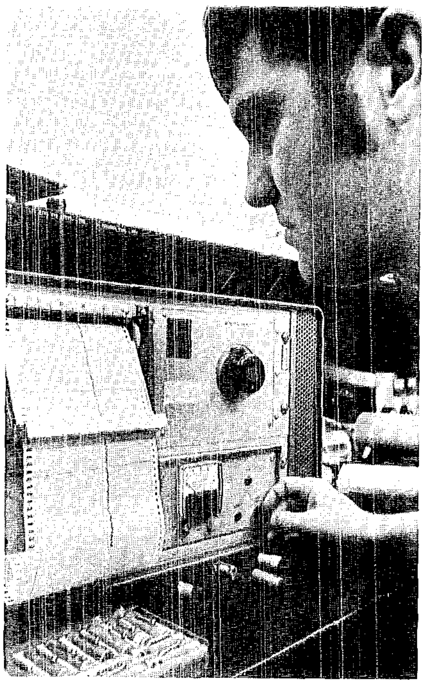




At right, Babich monitors a vehicle at GT site. The tag on the key certifies the vehicle has been monitored and is "clean."

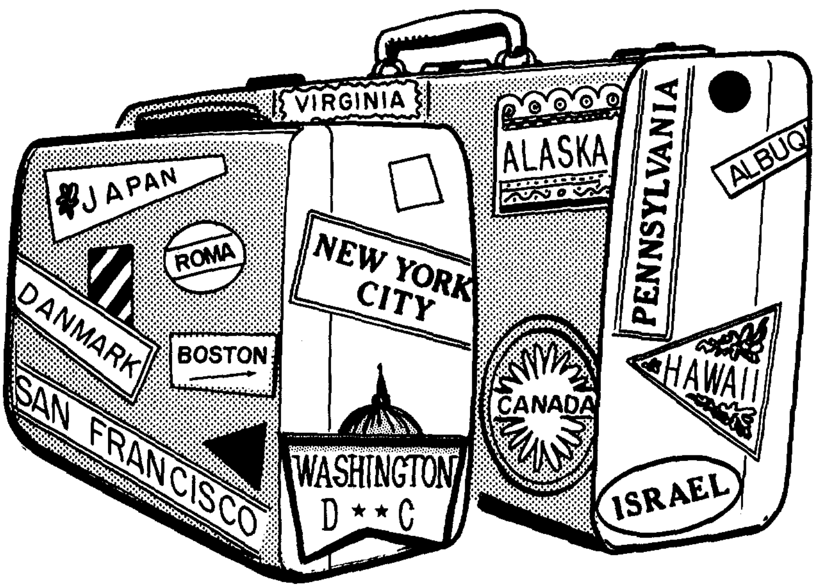






Robert Martin counts thermoluminescence dosimeter readings taken at the Phermex facility.

Robert Sandoval uses a radector at the door of a hot cell in Wing 9 of the CMR building. The radector is a beta-gamma monitor at the end of a long pole. It allows monitoring from a distance.



Vacation Travel Opportunities For LASL Employees

The Los Alamos Scientific Laboratory has accepted an invitation to affiliate with the Lawrence Radiation Laboratory Recreation Association's (RLRA) 184 Club which provides recreational activities for employees of the Lawrence Radiation Laboratory at Berkeley, California.

The establishment of LASL as a member makes its employees eligible for certain activities, including group travel at reduced cost in the United States and some foreign countries.

The Laboratory's relationship with the recreation club evolved through the efforts of a four-member committee made up of Charles Canfield, personnel director; Edward Laymen, alternate personnel director; Del Sundberg, public relations director; and Harold Agnew, Weapons division leader. Canfield said affiliation is made possible because LASL and LRL personnel are commonly employed by the University of California.

He noted, there are no present plans for program-sponsored recreational activities at Los Alamos. But, according to correspondence received by Canfield from Bill Lathrop, Club representative in Berkeley, LASL employees are eligible to participate in Club-sponsored activities there. Occasionally LASL and LRL personnel conduct joint experiments and other official business at Berkeley, which makes use of the California-based recreational facilities by Los Alamos personnel likely. In his letter to Canfield, Lathrop said, "Should any of your group be stationed in this area and participate in our chess, bridge, bowling, golf, or other activities which receive financial benefit, then the

$1.00 (dues) per year would be required. Travel is, and must be, self-supporting.

The travel part of the program will probably be of most interest to Laboratory employees. All eight tours planned for the current year will originate in San Francisco. Arrangements for transportation from Los Alamos to the point of departure will be an individual responsibility.

For the convenience of employees, some of the tours have several departure dates. The cost of any of the group trips generally includes round-trip transportation, lodging, sight-seeing and other expenditures usually incurred on vacation trips.

Here are the group tours planned for the current year:

Alaska Inland Cruise

The cost of the 12-day trip is $599 on any of four departure dates: May 30, June 23, Aug. 26 and Sept. 3. The tour groups will leave San Francisco via airline to Vancouver, British Columbia, where its members will stay overnight and tour the city the following day. That night, travelers will board a sightseeing ship for a cruise through the Inland Passage. They will also visit the Mendenhall Glacier at Juneau and take a narrow gauge railroad train along the Gold Rush Trail to Lake Bennett and Carcross. On the eighth morning they will return to Vancouver and tour Seattle.

The price of this trip will include round-trip airline transportation; lodging in Vancouver, Seattle, and aboard the sightseeing-ship; three meals in Seattle; sightseeing; transfers; hotel portage; local hotel taxes.

Canadian Rockies and Eastern Seaboard

This is a 23-day trip for $795 departing Oct. 4 and returning Oct. 26. The tour group will depart San Francisco for Vancouver where a day will be spent sightseeing. It will board the Canadian National Vista Dome "Panorama" to Jasper, arriving the next morning. Two nights will be spent at Jasper Park Lodge. The group will visit the Columbia Ice Fields and then proceed by train to Ottawa, Montreal and Quebec, spending two days in each of these cities. From Quebec they will fly to Boston, New York, Gettysburg, Pa. and Washington, D.C. before returning to San Francisco.

The rate includes air transportation; lodging; train sleeping accommodations and all meals from Vancouver to Ottawa; lodging and meals at Jasper Park Lodge; dinner in Vancouver, breakfast and dinners in Ottawa, dinner in Boston and lunch in Washington, D.C.; sightseeing throughout.

Hawaii

There are eight departure dates for this eight-day tour at varying rates. The rate for departures on May 3, June 7, Oct. 4 and Nov. 1 will be $269. An additional $25 per person will be charged for a tour departing Dec. 27. Other departure dates at the rate of $289 per person are May 16, Aug. 29 and Oct. 10.

The members of this tour will take sightseeing trips in Honolulu and to Mt. Tantalus.

The rate includes round-trip airline transportation; seven nights lodging at Waikiki Beach; transfer from airport and hotel; hotel taxes; city and Mt. Tantalus sightseeing.

Hawaii Air / Sea Cruise

This is a 15- to 17-day trip for $535 with an optional trip to two outer islands for an additional $164 per person. There are five departure dates: March 19, May 27, Aug. 29, Sept. 19 and Nov. 6.

Those taking the tour will fly from San Francisco to Honolulu where they will spend nine nights. Sightseeing trips are planned within the city, to Mt. Tantalus and Pearl Harbor. The touring group will return to San Francisco aboard the S. S. Lurline which will leave Hawaii on the 10th day.

The rate includes lodging in Honolulu and aboard the S. S. Lurline; transfers between airport, hotel and pier; all meals and snacks aboard the ocean liner.

Those taking the optional trip will leave Honolulu on the fifth day for the islands of Hawaii and Kauai where they will spend five days. The additional charge will cover air transportation between the islands; all transfers, sightseeing and baggage tips; breakfast on all five days.

Cradles of American History

This trip embraces American history. It is a 16-day tour for $535, plus $10.85 air tax, with departure dates of July 12 and Sept. 27.

From San Francisco the touring group will fly to Boston. Highlights of the trip will include sightseeing trips to Boston, the Freedom Trail following Paul Revere's ride; dinner at the historic Wayside Inn; Plymouth Rock; the Hudson Valley; Manhattan; Gettysburg; Annapolis; Washington, D.C.; Charlottesville; Monticello; Richmond; Jamestown and Williamsburg.

The rate includes round trip air transportation;

continued on next page

Vacation Travel . . .

continued from preceding page

lodging; sightseeing; special meals in Boston, New York and Washington, D.C.

East Coast Discovery—New York / Washington

The Discovery tour is a nine-day trip for $299 plus $10.85 air tax. There are six departure dates: July 12, July 26, Aug. 9, Sept. 13, Sept. 27, and Oct. 12.

The trip includes six nights in New York and two nights in Washington, D.C. It is considered to be a budget tour for people who like to move around on their own after basic sightseeing, although specific tours will be suggested.

The rate includes round trip air transportation; lodging; transfers and sightseeing in New York City; tickets for Radio City; a special dinner; motorcoach transportation from New York to Washington; Sightseeing in Washington; transfers to airport.

The Orient

The Orient Tour is a 23-day venture in Japan, Taipei, Thailand, Singapore, Kuala Lumpur, Malacca, Hong Kong and Waikiki Beach for $1,275.

The rate includes round trip air transportation; lodging; all meals outside of Tokyo while touring Japan; sightseeing.

The Holy Land

The rate for this 23-day tour is $1,195 departing on July 7.

It includes a tour of Israel and overnight stays in Copenhagen, Athens and Rome. Visitations will be made to Bethlehem, Jericho, the Dead Sea, Tiberias, Nazareth, Haifa and Tel Aviv.

The rate includes air transportation; lodging; all meals in Israel, several other meals; sightseeing and hotel tips and transfers.

A brochure, explaining these tours, accompanied by a cover letter from Canfield, has been distributed among division and group leaders. More detailed information on specific tours is available at the LASL Travel office from PER-7 Group Leader Charles Harper and Assistant Group Leader Mrs. Jean Kelley.

The Travel office will also coordinate tour arrangements between LASL and the 184 Club.

Canfield noted that arrangements for desired tours should be made well in advance because transportation tickets and other instructions are issued one month prior to departure.

short subjects

Gerald F. Tape, an Atomic Energy Commissioner since July of 1963, has resigned to become president of Associated Universities, Inc., a post he held when appointed commissioner. A successor for the AEC position has not yet been appointed.

Tape will assume his AUI duties after April 15. The corporation operates the Brookhaven National Laboratory on Long Island for the AEC and the National Radio Astronomy Observatory in Charlottesville, Va., and Green Bank, W.Va. for the National Science Foundation. It is a national, non-profit research management organization, sponsored by Columbia, Cornell, Harvard, Johns Hopkins, Massachusetts Institute of Technology, Princeton, Pennsylvania, Rochester and Yale Universities.

Of 54 patents recently made available by the Atomic Energy Commission for public use, five are for inventions of Los Alamos Scientific Laboratory employees.

The five are the Atmospheric Nitrogen Fluorescence Detection Apparatus by **D. R. Westervelt,** J-14; Automatic Superconducting Pump by **H. L. Laquer** and **E. F. Hammel,** both of CMF-9, and **K. J. Carroll,** formerly of CMF-9; Method and Apparatus for Improving Recovery of Plutonium-Gallium Alloys by Electrorefining by **J. A. Leary** and **L. J. Mullins, Jr.,** both CMB-11, and **J. F. Buchen,** CMB-7; Electropolishing Platinum in a Molten Bath of Potassium Thiocyanate and Potassium Cyanide by **R. Seegmiller** and **J. K. Gore,** both CMB-6; Method of Making Solid Solution Carbide-Graphite Compositions by **R. E. Riley, K. V. Davidson** and **J. M. Taub,** all of CMB-6.

Mrs. Hazel May, a P-1 electronics draftsman for 15 years, has retired. She plans to continue her interests in the Light Opera Company and Little Theater in Los Alamos. Her husband, Frank, is employed by D-8 and daughter, Mrs. Nancy Sanchez, is C-1 group secretary. Her son, Captain Dawson May, is stationed at Camp Roberts, Calif.

William A. Steyert, CMF-9, has been granted Professional Research and Teaching Leave for six months at the University of Tokyo, Japan. Steyert will be doing very low temperature solid state physics research.

He and his family left Los Alamos for Japan March 15 and are expected to return in early October.

Raemer E. Schreiber, technical associate director of the Los Alamos Scientific Laboratory, has been appointed to represent the American Nuclear Society as a member of the National Research Council's Division of Physical Sciences.

Schreiber was nominated for the position by ANS President Karl P. Cohen. His appointment to the position marks the Society's first affiliation with the National Research Council. He will serve a term expiring Dec. 31, 1971.

Schreiber is a Fellow and immediate past president of the ANS and has had long experience in the nuclear reactor and nuclear weapons fields.

The National Research Council was organized in 1916 by the National Academy of Sciences. It now serves the Academy and the National Academy of Engineering in the discharge of their responsibilities. Its members are drawn from governmental, academic, industrial, and other private organizations and institutions throughout the country.

Richard F. Brenton, N-7 assistant group leader, has retired after almost six years with the Laboratory. He was employed as a staff member with J-17 at the Nevada Test Site and became assistant group leader in 1964. In 1965 he transferred to N-7 as assistant group leader. His retirement was effective March 13. He and his wife, Leah, and four children live in Los Alamos.

Two LASL employees died recently. They are **Rea Blossom,** J-6 group leader, and **Gordon S. Erickson,** GMX-4 mechanical fabrication technician.

Blossom died Feb. 28. He had been employed by the Laboratory since 1955. Services were held at Trinity-on-the-Hill Episcopal Church with interment in Santa Fe National Cemetery following military services. He is survived by his wife, Lorna, and five sons, Rea Bruce, James Michael, David Andrew, Patrick Brian, and Robert Quentin.

Erickson had been employed by the Laboratory since 1954. He died March 2. Services were held at Bethlehem Lutheran Church in Los Alamos. Interment following military services was in the Santa Fe National Cemetery. He is survived by his wife, Dorothy, and one daughter, Mrs. Judith Ann Lamberto.

The New Mexico Section of the American Vacuum Society will hold its Annual Meeting and Surface Science Symposium in Los Alamos April 28-30.

The meeting, co-sponsored by the Laboratory, will include a concurrent course in vacuum technology. L. C. Beavis of the Sandia Corporation, Albuquerque, a recognized authority in vacuum technology, is the course director and principal lecturer. Registration forms may be obtained by contacting **Karl Johnson,** CMB-11 or **Claude Winkelman,** K-3.

For Reporting Change of Address

If your address has changed please inform THE ATOM by clipping and filling out this coupon. Print or type your name and both your old and new addresses.
Mail to: The Atom
Los Alamos Scientific Laboratory
Box 1663
Los Alamos, N.M. 87544

Previous Address

name

address

city state zip code

New Address

address

city state zip code

The Technical Side

Presentation at meeting, Virginia Polytechnic Institute, Blacksburg, Jan. 20-23:

"Numerical Studies of the Initial-Value Problem for the One-Velocity Neutron Transport Equation with Delayed Neutrons in Slab Geometry" by W. L. Hendry and N. S. DeMuth, both T-1

"Spatial Differencing of the Transport Equation: Positivity vs Accuracy" by K. D. Lathrop, T-1

Presentation at American Nuclear Society National Topical Meeting, Albuquerque, Jan. 28-30:

"Short Moderator Pulses and Booster Systems" by R. G. Fluharty, P-DOR

Presentation at Ceramic Armor Symposium, Batelle Memorial Institute, Columbus, Ohio, Jan. 29-30:

"Essentials of Shock Wave Physics" by J. W. Taylor, GMX-6 (invited talk)

Presentation at 15th Meeting of the Refractory Composites Working Group, Los Angeles, Calif., Feb. 3-5:

"Control of Graphite Properties Through Control of Raw Material and Manufacturing Variables" by M. C. Smith, CMF-13

"Refractory Composites Technology at LASL" by R. E. Riley, CMB-6

Presentation at American Physical Society Meeting, New York, Feb. 3-6:

"Absolute Cross Sections for P-^{3}He Elastic Scattering at 16.23 MeV" by R. L. Hutson and N. Jarmie, both P-DOR

"Elastic Scattering of Neutrons by Selenium" by M. M. Hoffman, D. D. Phillips, and L. J. Brown, all J-12

"Energy Levels of ^{43}K and ^{44}K" by F. Ajzenberg-Selove and G. J. Igo, both P-DOR

"Lasers in Plasma Interferometry" by F. C. Jahoda, P-15 (invited talk)

"Polarization of Tritons Scattered from Hydrogen" by L. R. Veeser, P-DOR, D. D. Armstrong, P-12, D. C. Doddler, T-9, and P. W. Keaton, P-DOR

new hires

C division

Aileen M. Cherry, Los Alamos, C-1
Carolyne S. Cook, Los Alamos, C-1
Dennis E. Galvez, Espanola, C-1
Ann M. Solem, Media, Ohio, C-2
Ellen E. Morris, Los Alamos, C-3
Max J. Seamons, Blackfoot, Idaho, C-4

CMB division

Larry L. Tellier, Danville, Ill., CMB-6
Alfred W. Nutt, Jr., Woodland, Ill., CMB-11

Engineering department

Walter E. Herkenhoff, Los Alamos, ENG-1
Robert W. Gardell, Santa Fe, ENG-6

GMX division

Roger W. Helman, Tucson, Ariz., GMX-3
James A. Lewis, Borden, Ind., GMX-3
Rudy L. Apodaca, Santa Fe, GMX-6
Jerome J. Damitz, Milwaukee, Wisc., GMX-7

H division

Arnold E. Hampel, Burlington, Ill., H-4 (postdoctoral)
Victor H. Kollman, Los Alamos, H-4 (casual-rehire)
James R. Prine, Corsicana, Texas, H-4
Tom O. Moore, Los Alamos, H-5

J division

John L. Cole, Jr., Santa Fe, J-1 (rehire)
David G. Gerke, Houston, Texas, J-14

K division

William W. Schertz, Tiskilwa, Ill., K-3 (rehire)

MP division

Delbert D. Kercher, Denver, Colo., MP-1
Christopher W. EagleHawk, Taos, MP-2
Bobby R. Rector, Deer Park, Texas, MP-3
Walter L. Hawkins, Bartlesville, Okla., MP-2 (rehire)
Charlie G. Dalton, Dallas, Tex, MP-4
Robert J. Macek, Faulkton, S. Dak., MP-6

Shops department

Elfino V. Armijo, Albuquerque, SD-DO
Eluterio A. Garcia, Abiquiu, SD-DO
Mark D. Stephenson, Santa Fe, SD-DO

T division

Johndale C. Solem, Chicago, Ill., T-2
Gerald I. Kerley, Hillsdale, N.J., T-5
Marion M. Hansen, Los Alamos, T-6
Leland L. Carter, Seattle, Wash., T-8

W division

Victor S. Starkovich, Los Alamos, W-7
Jose M. Anaya, Santa Fe, W-8
William C. Lyons, Albuquerque, W-8

"Transformations from Center-of-Mass to Laboratory Coordinates for Two- and Three-Body Scattering Events" by W. B. Maier, J-10

Lecture given in a short course in particle technology, UCLA, Los Angeles, Calif., Feb. 3-7:

"Problems in the Characterization of 'Graphite Powders" by H. D. Lewis, CMF-13

"Small Particle Statistics—The Analysis of Particle 'Size' Data" by H. D. Lewis, CMF-13

Presentation at Physics Seminar, UCLA, Los Angeles, Calif., Feb. 5:

"Direct Reactions Studies with 20-MeV Tritons" by E. R. Flynn, P-DOR

Presentation at Physics Department Seminars at New Mexico Institute of Mining and Technology, Socorro; Arizona State University, Tempe; New Mexico State University, Las Cruces; University of Arizona, Tucson; Iowa State University, Ames; and Kansas State University, Manhattan, Feb. 6-March 3:

"Electromagnetic Aspects of Proton Scattering" by J. E. Brolley, P-DOR

Presentation at Explosives Group Seminar, Lawrence Radiation Laboratory, Berkeley, Calif., Feb. 6:

"The Kinetics and Mechanisms of the Thermal Decomposition of Cyclotetramethylenetetranitramine (HMX)" by M. Stammler, GMX-2 (invited talk)

Presentation at Colloquium, Colorado General Hospital, Denver, Feb. 10:

"The Los Alamos Meson Factory-A Unique Opportunity for Cross Fertilization Between the Natural and Medical Sciences" by L. Rosen, MP-DO (invited talk)

Presentation at Physics Department Seminar, University of Washington, Seattle, Feb. 11:

"Biological Electron Microscopy" by J. H. Manley, Dir. Off

Presentation at Colloquia at the Physics Department of the University of California, Berkeley, Feb. 11:

"Application of Kruskal's Asymptotic Theory to Derive Exact Invariants for the Classical Time-Dependent Harmonic Oscillator and for the Motion of a Charged Particle" by H. R. Lewis, P-18

Presentation at Joint US/UK EIVR-10 Meeting, AWRE, Aldermaston, England, Feb. 3-7:

"More Recent Developments of Plastic Bonded Detectors" by E. P. Ehart, CMB-6

"Specialty Coatings for High-Performance Applications" by S. E. Newfield, E. E. Eaton, and E. P. Ehart, all CMB-6

"Epoxy Resin Systems and Winding Conditions for Filament Winding on Explosives" by W. A. May, GMX-3

"Cushion Design and Long-Term Aging of Flexible Cushioning Materials Held at 50% Deflecton" by W. A. May, GMX-3

Presentation at Bettis Atomic Power Laboratory, Pittsburgh, Pa., Feb. 13:

"Maintaining Positivity of Discrete Ordinates Solutions to the Transport Equation" by K. D. Lathrop, T-1

Presentation at colloquia at the Physics Department of the University of California, Berkeley, Calif., Feb. 13:

"An Exact Quantum Theory of the Time-Dependent Harmonic Oscillator and of a Charged Particle in a Time-Dependent Electromagnetic Field" by H. R. Lewis, P-18

Presentation at Annual Engineers' Week observance, sponsored by Nevada Society of Professional Engineers of Southern Nevada Chapter, Las Vegas, Feb. 15:

"Principle, Past, and Prognosis for Nuclear Rockets" by J. B. Henshall, J-17, NRDS

Presentation at seminar program at the Armed Forces Radiobiology Research Institute, Bethesda, Md., Feb. 20:

"Radiobiological Considerations of Man's Exposure to Uncontrolled Sources" by W. H. Langham, H-4 (invited talk)

Lecture given at West Texas State University, Canyon, Texas; Texas Wesleyan College, Ft. Worth; University of Houston; and the University of Texas, Austin, Feb. 24-28:

"Molar Refractivity as a Diagnostic Tool for Transition Element Complexes" by R. A. Penneman, CMF-4

Presentation at Biophysical Society Annual Meeting, Los Angeles, Calif., Feb. 25-28:

"DNA Distribution in Cell Populations by High-Speed Microfluorometry" by M. A. Van Dilla, T. T. Trujillo, and P. F. Mullaney, all H-4

"Effect of Suboptimal Growth Temperatures on Recovery from Radiation-Induced Division Delay" by R. A. Walters, B. R. Burchill, and D. F. Petersen, all H-4

"Growth and Division of Mammalian Cells in Exponential and Synchronized Populations" by G. I. Bell, T-DOT

"Response of Haemophilus Influenzae to Ultraviolet Irradiation" by G. J. Kantor, S. H. Cox, and B. J. Barnhart, all H-4

"Small-Angle Light Scattering by Biological Cells" by P. F. Mullaney, M. A. Van Dilla, and P. N. Dean, all H-4

"Volume Growth and the Dispersion of Synchronized Cells" by E. C. Anderson, H-4, G. I. Bell, T-DOT, D. F. Peterson and R. A. Tobey, both H-4

"Calculated Sedimentation Patterns in Interacting Systems" by W. B. Goad, T-4, and J. R. Cann, University of Colorado, Denver.

Presentation at AIAA Electric Propulsion Conference Williamsburg, Va., March 3-5:

"Experiments Using a 25 KW Hollow Cathode Lithium Vapor MPD Arc Jet" by D. B. Fradkin, N-7, A. W. Blackstock, D. J. Roehling, T. F. Stratton, M. Williams and K. W. Liewer, all N-5

Presentation at Nuclear Chemistry graduate student seminar, University of Chicago, March 5:

"Preparation of a ^{237}U Target for Fission Cross Section Measurements" by B. J. Dropesky, J-11

20

years ago in los alamos

Culled from the April 1949 files of the Los Alamos Skyliner by Robert Porton

Ahoy, Skipper!

Four Los Alamos youngsters were found playing in a fenced-off radioactive-waste deposit area in the canyon yesterday. The children were seen by town police, who quickly turned them over to Laboratory health officials. When questioned as to why they were down there, the calm answer, "Sailing boats," was given. The kids were found to be in good health and were released. How they got into the restricted area remains a mystery.

Importance of Atomic Energy Stressed

Describing himself as a "working guy" and his philosophy as "likely to be pretty earthy," Brigadier General James McCormack, Jr., AEC director, Division of Military Application, addressed a teachers conference in New York this week. He told the group that "an understanding of the meaning of atomic energy is just about the most important single item in the educational field today." Calling Los Alamos the center of our defense complex, he said, "its isolation is still of importance to the security of its work . . . building the community has been expensive, but it has been well worth the cost. The needs of the project and the gloomy international situation of the last three years have caused the Laboratory to again become one of the finest in the world . . ."

Welfare Board Seeks Money

An emergency case brought to a head this week financial problems of the Los Alamos Public Health and Welfare Board, recently organized in an attempt to deal with misfortunes of townspeople. Community Council, Inc. will vote tonight on a request for funds made by the Board. A member of the group stated that "Los Alamos does have needy cases, the result of accident or misfortune which may strike anyone at any time". Plans are underway to promote good relations between hospital and public and to estimate town welfare and health needs until a professional unit can be employed.

Prices at Hill Markets Show Downward Trend

Prices of groceries in the two supermarkets in Los Alamos are showing the same downward course as noted in the rest of the country, the AEC Concessions Office revealed today. Results of a survey of 642 name items showed an average decrease of 5.41 per cent over a period of a little more than seven months. The survey compared prices of 350 items in the Community Center market while 292 items of like brands, quality and size of package were surveyed in the Western Area store.

what's doing

LOS ALAMOS SKI CLUB: Pajarito Mountain, tow runs from 9 a.m. to 4 p.m. weekends and holidays. Rental equipment available. Ski School Schedule—Group lesson, six to 12 students, one and a half hours, 10:30 a.m. and 1:30 p.m. Semi-private lessons, up to three students, one hour, 10:30 a.m., 12:15 p.m. and 1:30 p.m. Young children's class, kindergarten and up, six to 12 students, 12:15 p.m.

SIERRA CLUB: Luncheon meeting at noon, first Tuesday of each month, South Mesa Cafeteria. For information call Brant Calkin, 455-2468, Santa Fe.

RIO GRANDE RIVER RUNNERS: Meetings scheduled for noon, second Tuesday of each month at South Mesa Cafeteria. For information call Cecil Carnes, 672-3593.

CONCERT INFORMATION: Final concert of season, Alma Trio, April 15, 8:15 p.m., Civic auditorium. Held in conjunction with membership drive, April 8-18. Headquarters, Fuller Lodge. For information call Mrs. Henry Filip, 2-2135.

OUTDOOR ASSOCIATION: No charge; open to the public. Contact leader for information about specific hikes.

April 6—Bandelier, Ken Ewing, 8-4488

April 13—To be decided, Terry Gibbs, 8-4909

April 17—Meeting, Ed Kmetko home 100 El Viento, 8 p.m.

April 26—State Road 4 to Rancho Canada, 2-4515

NEWCOMERS CLUB: Meeting, April 23, 7:30 p.m., Los Alamos National Bank Hospitality room; Topic—Beginning Instruction in Art. For information call Mrs. T. L. Talley, 2-4110.

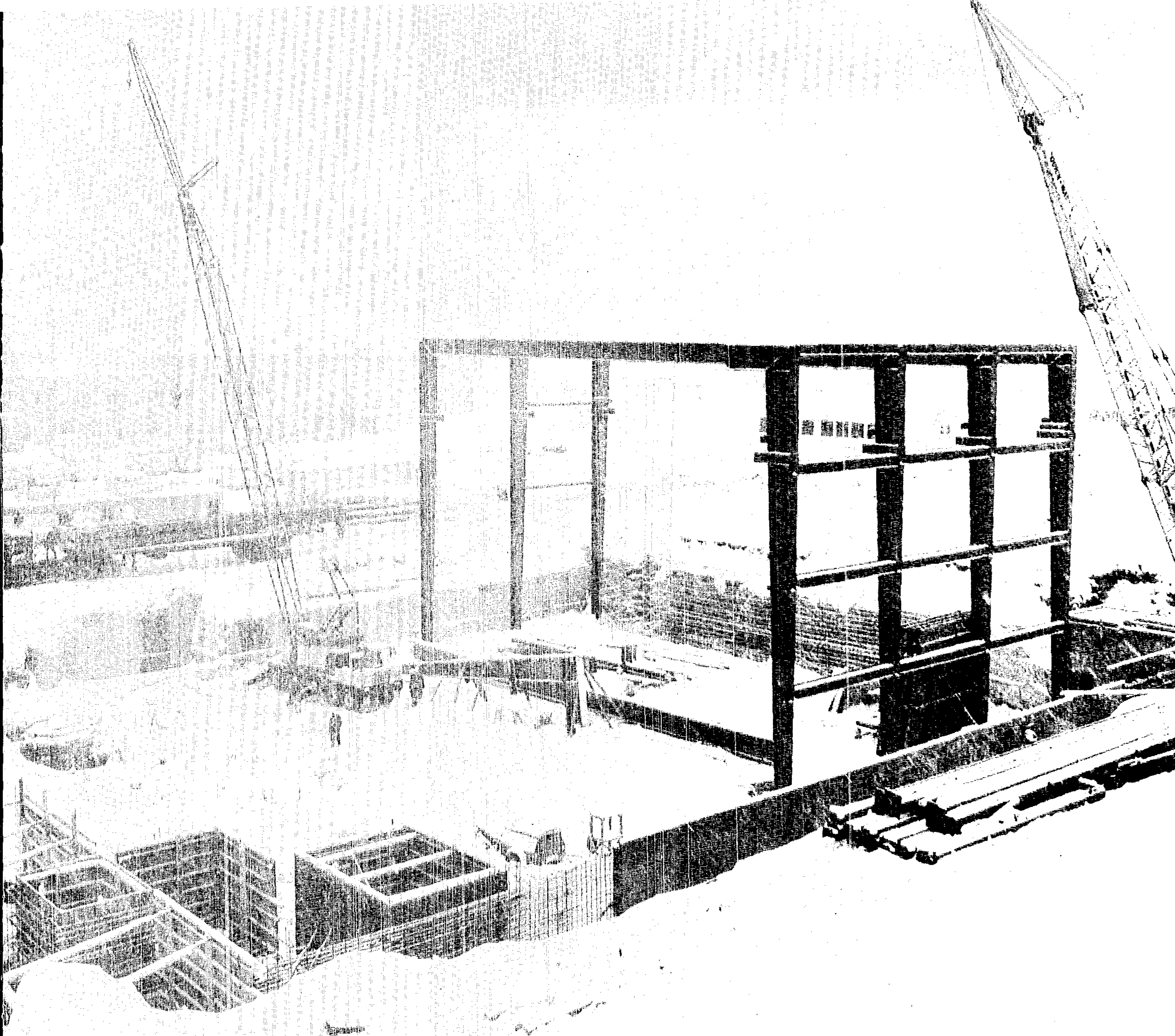
HOSPITAL AUXILIARY: Fifty Flags Frolic, Saturday, April 12, 9 p.m. to 1 a.m., Recreation Hall. Music by All-Stars. Mexican food prepared by LULAC's. $8 per couple, $4 single. Reservations necessary. Telephone Mrs. Raymond Gray, 2-6001. Sponsored by the Hospital Auxiliary of the Los Alamos Medical Center, Inc. Proceeds to purchase a coronary care unit.

PAJARITO FIELD ARCHERS: Business meeting fourth Monday of every month. Shooting nightly, leagues now forming. For information call Leland Zollers, president, 2-4043.

MESA PUBLIC LIBRARY: March 21-April 24, Oils by Virginia Brown, Los Alamos.

PUBLIC SWIMMING: High School Pool—Mondays, Tuesdays and Wednesdays from 7:30 to 9 p.m., and Saturdays and Sundays from 1 to 6 p.m.; Adult Swim Club, Sundays, 7 to 9 p.m.

Paintings by Hal Olsen currently on display in the lobby of the Personnel building.



Not even the unexpected heavy snows of early March could delay progress of construction for the Laboratory and Energy Storage Facility for Scyllac. First loads of steel beams arrived with the first storm of the month and erection of the building's framework proceeded on schedule in spite of low temperatures and 20.4 inches of snow distributed over 12 days. The building for Scyllac will cost about $2.2 million and should be completed by Jan. 1970. Scyllac is another experiment on the road to achieving the controlled release of thermonuclear energy for peaceful purposes— Project Sherwood.

Henry T. Motz
3187 Woodland
Los Alamos, New Mexico